




Brandeis University



Waltham, Massachusetts







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**BRANDEIS UNIVERSITY**

**GRADUATE SCHOOL OF ARTS AND SCIENCES**



**1959-1960**



**WALTHAM, MASSACHUSETTS**





Catalog Dept.

BRANDEIS  
UNIVERSITY  
BULLETIN  
1959-1960



Graduate  
School of  
Arts  
and  
Sciences

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## GRADUATE SCHOOL OF ARTS AND SCIENCES

## Academic Calendar

1959-1960

## FALL SEMESTER

September 24, Thursday and September 25, Friday	Registration, including payment of fees, 9:00 a.m. to noon, 1:00 to 5:00 p.m., in Sydemann 2 and 3. There will be a \$10.00 fee for late registration.
September 28, Monday	Classes begin.
October 9, Friday	Final date for registration.
October 12, Monday	No classes.
October 13, Tuesday	Final date for changing study program without fee of \$10.00.
October 19, Monday	Final date for adding any courses for credit.
November 11, Wednesday	No classes.
November 26, Thursday	No classes.
November 27, Friday	No classes.
December 18, Friday	Winter recess begins after last class.
January 4, Monday	Classes resume.
January 15, Friday	Registration for Spring Semester for all students in residence. Resident students will be charged a \$10.00 fee for late registration.
January 18, Monday through January 29, Friday	Mid-year examinations.
January 28, Thursday and January 29, Friday	Registration for students entering for the Spring Semester. New students who register at a later date will be charged a \$10.00 fee.
January 28, Thursday	Final date for reporting grades for students who received "Inc." in the previous semester.
January 29, Friday	Final date for admission to candidacy for the Ph.D. and for completion of residence and language requirements for all students expecting to have the Ph.D. conferred in June, 1960.

## SPRING SEMESTER

February 1, Monday	Classes resume.
February 15, Monday	Final date for registration of new students. Final date for change of study program without fee of \$10.00.
February 22, Monday	No classes.
February 23, Tuesday	Final date for adding any course for credit.
March 1, Tuesday	Final date for filing applications for fellowships and scholarships for 1960-61.
April 1, Friday	Final date for applying for readmission for 1960-61. Final date for applying for all graduate degrees for June, 1960.
April 8, Friday	Spring recess begins after last class.
April 21, Thursday	Classes resume.
May 2, Monday	Final date for submitting Master's thesis.
May 16, Monday	Final date for certification by the Faculty that June Ph.D. candidates have satisfactorily completed and defended dissertations.
May 20, Friday	Final date for deposit of Ph.D. dissertations with Librarian.
May 27, Friday	Final date for reporting grades for students who received "Inc." in the previous semester.
June 1, Wednesday	Final date for June degree candidates to pay the Diploma Fee and to discharge all financial indebtedness to the University.
June 2, Thursday	Grades due for candidates for degrees.
June 10, Friday	Grades due for all Spring Semester and full-year courses.
June 12, Sunday	Commencement.

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## The Role of the University

Brandeis University is named for the illustrious jurist, Louis Dembitz Brandeis. The founders of the University have been inspired by the challenge of Justice Brandeis' ideal of what a university should be:

*"It must always be rich in goals and ideals, seemingly attainable but beyond immediate reach . . ."*

*"It must become truly a seat of learning where research is pursued, books written, and the creative instinct is aroused, encouraged, and developed in its faculty and students."*

*"It must ever be mindful that education is a precious treasure transmitted—a sacred trust to be held, used, and enjoyed, and if possible strengthened, then passed on to others upon the same trust."*

At the inaugural ceremonies in October, 1948, the aims of Brandeis University were stated by the first President, in the form of a three-fold promise. First, Brandeis will be an institution of quality where the integrity of learning, of research, of writing, of teaching, will not be compromised. An institution bearing the name of Justice Brandeis must be dedicated to conscientiousness in research and to honesty in the exploration of truth to its innermost parts.

Secondly, Brandeis University will be a school of the spirit—a school in which the temper and climate of the mind will take precedence over the acquisition of skills, and the development of techniques. Brandeis will be a dwelling place of permanent values—those few unchanging values of beauty, of righteousness, of freedom, which man has ever sought to attain.

Finally, Brandeis will offer its opportunities of learning to all. Neither student body nor faculty will ever be chosen on the basis of population proportions whether ethnic or religious or economic.

Brandeis University came into being because of the desire of American Jewry to make a corporate contribution to higher education in the tradition of the great American secular universities which have stemmed from denominational generosity. By choosing its faculty on the basis of capacity and creativity and its students according to the criteria of academic merit and promise, the University hopes to create an environment which may cause the pursuit of learning to issue in wisdom.

## The Special Character

The University has set itself to develop the *whole* man, the sensitive, cultured, open-minded kind of citizen who grounds his thinking in facts, who is intellectually and spiritually aware, who believes that life is significant and who is concerned about a going society and the role he will play in such a society.

The University will not give priority to the molding of vocational skills nor is it partial to the development of specialized interests at the expense of a solid general background. This should not be construed to mean that what is termed practical or useful is to be ignored. Brandeis merely seeks to avoid specialization which is unrelated to the heritage of the Western World—its humanities, its social sciences, its sciences and its creative arts. For otherwise it produces fragmented

men with the compartmentalized point of view which has been the bane of contemporary life.

A realistic educational system must offer adequate opportunity for personal fulfillment. The ego is precious and it should be protected and enriched. Education at Brandeis encourages the drive for personal fulfillment, but only within the framework of social responsibility.

Thus Brandeis belongs with many of its sister institutions as it strives for full-orbed personalities, practical enough to cope with the problems of a technological civilization, yet mellowed by the values of a long historical heritage; self-sufficient to the point of intellectual independence, yet fully prepared to assume the responsibilities which society imposes.

## University Organization

Brandeis University comprises the College of Arts and Sciences, the Graduate School of Arts and Sciences, the Florence Heller School for Advanced Studies in Social Welfare and the Summer School.

The College of Arts and Sciences offers instruction leading to the Bachelor of Arts degree in the Schools of Creative Arts, Humanities, Social Science and Science. Regularly matriculated students pursuing courses of instruction under the Faculty of Arts and Sciences may, upon satisfactory completion of the first year, continue as candidates for the Bachelor of Arts degree.

Introductory and survey courses in all fields provide a foundation for the student's general education as distinguished from his more intensive pursuit of knowledge within specialized areas. After the first year's work is satisfactory completed, each student will select a provisional field of concentration from the programs of studies offered by one of the Schools. A full listing of courses of instruction in the College of Arts and Sciences appears in a later section of the catalog.

The Graduate School of Arts and Sciences offers courses of study leading to the master's and doctor's degrees. Graduate areas include Anthropology, Biochemistry, Biology, Biophysics, Chemistry, English and American Literature, History of Ideas, Mathematics, Mediterranean Studies, Music, Near Eastern and Judaic Studies, Physics, and Psychology. Further information may be obtained by addressing the Dean, Graduate School of Arts and Sciences, Gryzmish Academic Center, Brandeis University, Waltham 54, Massachusetts.

The Florence Heller School for Advanced Studies in Social Welfare, made possible through the generous grant of Mrs. Florence Heller of Chicago, was established at Brandeis University in 1959. Applicants are required to have earned the degree of Master of Social Work at an accredited school and, preferably, to have had experience on a professional level. The program of study leads to the Doctorate and is designed to qualify graduates for administrative and consultant roles in established areas of social work endeavor, as well as newly emergent areas such as international social work, inter-group organization, labor, industry and government. Special emphasis will be placed upon community organization, social work administration, and research, making full use of relevant principles and experiences from the social sciences. Further information may be obtained from Dean, School For Advanced Studies in Social Welfare, Woodruff Hall, Brandeis University, Waltham 54, Massachusetts.

The Summer School of Brandeis University, established in 1957, places empha-

## THE ROLE OF THE UNIVERSITY

sis upon a relatively new development in summer school study. All courses are offered within the framework of Institutes embodying unifying themes. The thematic approach enables faculty and students to relate their experience in one course to that in another and to meet in colloquia and conferences, sometimes cutting across disciplinary lines.

Further information may be obtained from the Director of the Summer School, Gryzmish Academic Center, Brandeis University, Waltham 54, Massachusetts.

## WIEN INTERNATIONAL SCHOLARSHIP PROGRAM

The Wien International Scholarship Program, created in 1958 by the Lawrence A. and Mae Wien Fund, is designed to further international understanding, provide foreign students with opportunities for study in the United States, and enrich the intellectual and cultural life of the Brandeis University campus.

Provisions of the Program permit the University to offer one year scholarships, covering tuition, room, board and where necessary, travel costs, to a total of 100 students from foreign nations. The first Wien Scholars enrolled for the academic year 1958-1959 and the maximum program will be in force by 1960-1961. Awards are made for each academic year and, in instances, may be renewed for a second year. Preference is given to applicants qualifying for admission as upperclassmen. Applicants must possess a knowledge of the English language.

All Wien Scholars study within the regularly organized curriculum. This is supplemented by special seminars, conferences, and field trips so that each Wien Scholar may have the opportunity to obtain a thorough understanding of all facets of American society.

Full information concerning the Wien International Scholarship Program may be obtained by addressing: Faculty Adviser, Wien International Scholars, Brandeis University, Waltham 54, Massachusetts.

## POSES ARTIST-IN-RESIDENCE PROGRAM

The Poses Artist-in-Residence Program has been established by a grant from Mr. and Mrs. Jack Poses of New York City. By enabling the University to bring to the campus each year outstanding artists, the entire creative arts program, and campus life in general, will be enlivened and enriched.

Poses Artists-in-Residence will live and work on campus during the school year, participating in seminars and providing critical assistance and direction to advanced students in the fine arts.

Arrangements have been concluded for Marc Chagall to serve as the first Poses Artist-in-Residence during the academic year 1959-1960. Poses Artist-in-Residence for 1960-1961 will be Oscar Kokoschka.

## RUBIN ANTHROPOLOGY PROGRAM

Continuing generous grants since 1951 from the Samuel Rubin Foundation of New York have resulted in an intensive and diversified program of training and field work in Anthropology.

The undergraduate program includes summer field work training for honors candidates and a fully subsidized scholarship program. A field expedition, seeking the origins of civilization, has been operating in Iran and Israel since 1957.



## THE ROLE OF THE UNIVERSITY

During the academic year 1959-1960, the University will launch the Samuel Rubin Institute for Graduate Studies in Anthropology. The program leading to the Doctorate will include a required summer of supervised field work training between the first and second year of graduate work and a third year field work program.

### ROSENSTIEL BIOCHEMISTRY PROGRAM

The graduate and research program in Biochemistry is described in detail in the Graduate School catalog. It is supported by a grant from the Dorothy H. and Lewis Rosenstiel Foundation made to Brandeis University "in support of research in the natural sciences with primary emphasis in Biochemistry."

Functioning since 1957, the Rosenstiel Biochemistry Program includes more than 50 graduate and post-graduate research Fellows. Among the agencies co-operating in sponsoring research are The National Science Foundation, National Institute of Health, Office of Naval Research, American Cancer Society, Atomic Energy Commission, The Eli Lilly Co. and the Howard Hughes Foundation.

### FLORINA LASKER FELLOWSHIP PROGRAM

A grant from the estate of the late Florina Lasker, made by her sisters, Miss Loula Lasker and Mrs. Etta Rosensohn, created the Florina Lasker Fellows in Civil Liberties and Civil Rights. During a full semester of each academic year, representative individuals who have been working in this field are invited to the campus for the purpose of pursuing, either on a credit or non-credit basis, a program of studies designed to strengthen their understanding of, and ability to function in, their roles. Stipends are at \$2,000, very likely to be augmented by the agencies from which the Fellows come. Applications are received from teachers, members of the clergy, personnel officers, the ranks of labor and government, from law enforcement officials, and professionals within this field. The Curator of the Florina Lasker Fellows in Civil Liberties and Civil Rights counsels the Fellows concerning their program of study, readings, and course work, and, in addition, organizes a continuing seminar with visiting lectures and field trips for the purpose of integrating theoretical approaches with practical requirements.

Full information may be obtained by addressing: Curator, the Florina Lasker Fellows, Brandeis University, Waltham 54, Massachusetts.

### HARVARD-BRANDEIS-HEBREW UNIVERSITY COOPERATION IN LEGAL STUDIES

Harvard University Law School, Brandeis University and the Hebrew University of Israel jointly sponsor at Harvard University a program designed to codify the law of the State of Israel.

The program seeks to stimulate the study of comparative law and legislation; to undertake legislative research relating to problems raised by bills under consideration in Israel; to establish a possible model for similar undertakings relating to the law of other new or rapidly changing societies; and to provide advanced training in legal research for exchange students, faculty government officials of the State of Israel.

## THE ROLE OF THE UNIVERSITY

### LOWELL INSTITUTE COOPERATIVE BROADCASTING COUNCIL

Brandeis University is a member of the Lowell Institute Cooperative Broadcasting Council, which sponsors the national award-winning educational radio station WGBH-FM and Boston's pioneer educational TV station WGBH-TV, Channel 2. Brandeis, along with Boston College, the Boston Symphony Orchestra, Boston University, Harvard University, Lowell Institute, MIT, the Museum of Fine Arts, the New England Conservatory of Music, Northeastern University, and Tufts University, makes its teaching facilities available for use by WGBH-FM and its television affiliate WGBH-TV. As a member of the Lowell Institute, which develops the programming for both stations, the University, through a three year Ford Foundation Grant, extends its educational facilities and concepts beyond the confines of the campus, into the Boston community and the communities served by the 40 stations of the National Educational Television Network.

### SUMMER INSTITUTE PROGRAM

The Brandeis University Summer Institute Program, sponsored by the Fellows of the University, seeks to broaden the academic scope of the University by offering a unique educational experience to the adult friends of Brandeis from all sections of the nation.

The 1959 offering, took the form of an intensive, one-week Institute on Contemporary American Civilization. Instructors were members of the Brandeis University faculty assisted by visiting authorities Mrs. Eleanor Roosevelt; Prof. Arthur M. Schlesinger, Jr., Harvard University; Dean Francis Keppel, Harvard University; Prof. Charles Frankel, Columbia University.

Planned as a regular summer offering of the University, future Institutes will explore other unified themes of importance in modern life.

### THE FESTIVAL OF THE CREATIVE ARTS

Periodically the University sponsors a Festival of the Creative Arts in its Ullman Amphitheatre. In the past it has featured the world premiere of Leonard Bernstein's "Trouble in Tahiti," a choreographed version of Stravinsky's "Les Noces," the world premiere of Kurt Weill's "Threepenny Opera" in the English adaptation by Marc Blitzstein, the first presentation in America of Poulenc's "Les Mamelles de Tiresias," a major art exhibit "Art on the Campus," and the American premiere of Darius Milhaud's opera "Medee" and ballet "Salade."

### BRANDEIS UNIVERSITY CREATIVE ARTS AWARDS

The establishment of the Brandeis University Creative Arts Awards was announced by the University during 1956. Awards are presented annually in the areas of Theatre Arts, Music, Poetry and Painting or Sculpture. In each of these fields of the Arts two types of awards are bestowed. Achievement medals are conferred upon successful artists for outstanding accomplishment during the year; and grants-in-aid are awarded to young talented persons, on recognition of their creative ability and encouragement for future study and training. Special juries are appointed annually in each of the fields to judge the competition. Medal recipients have included:

Stuart Davis, William Carlos Williams, Willium Schuman, Hallie Flannagan Davis, Jacques Lipchitz, John Crowe Ransom, Roger Sessions, Stark Young, Edwin Dickinson, George Kelly, Ernest Bloch, and "H.D." (Hilda Doolittle Adlington.)

## THE ROLE OF THE UNIVERSITY

### Professorships and Lectureships

Private donors and foundations have established lectureships which supplement the established curriculum and brings to campus prominent authorities from varying fields:

#### ZISKIND PROFESSORSHIPS

To implement its philosophy of education, the University brings to the campus distinguished academic figures from sister universities both in the United States and abroad who serve as Ziskind Visiting Professors. This program, made possible by the Jacob Ziskind Endowment Fund, enables the University to supplement its regular teaching staff with the presence of academicians drawn from every major stream of educational thought. Inclusion of distinguished foreign academicians serves to challenge and stimulate faculty and students with the introduction of new concepts and new educational viewpoints, thus strengthening the entire educational process.

#### HARRY B. HELMSLEY LECTURES

Established for the purpose of reducing barriers that separate races, creeds and nationalities, the Helmsley Lecture series has in recent years presented Otto Klineberg, Martin Luther King, Jr., Oliver C. Cox, Ina DeA. Reid, Bruno Bettelheim, E. Franklin Frazier, Martin D'Arcy, Paul Tillich, Henry Aiken, Northrop Frye, Emmanuel Rackman, Joseph Campbell, Daisetz Suzuki, Will Herberg, Henry Cadbury, and Anton Pegis. The 1958-1959 series dealing with "Major Figures in Religious History" included Richard McKeon on St. Augustine, Alexander Altmann on Maimonides, and Clarence Faust on Jonathan Edwards.

#### STEPHEN S. WISE MEMORIAL LECTURE

This annual lecture in memory of Rabbi Stephen S. Wise was established by Nathan Straus of New York, a Fellow of the University. The Stephen S. Wise Memorial Lecture brings to Brandeis University each year a distinguished academician drawn from the areas of liberalism and social justice which represent the interests of the late rabbi.

#### SIDNEY HILLMAN LECTURES

Made possible by the Sidney Hillman Foundation, this program has enabled the University to present series of lectures by the following: Robert Maynard Hutchins, Max Lerner, Eliahu Elath, Eleanor Roosevelt, Robert Carter and Clinton Rossiter.

#### ANNUAL LOUIS DEMBITZ BRANDEIS MEMORIAL LECTURE

An annual lecture series has been established in commemoration of the birthday of Louis Dembitz Brandeis, for whom the University is named. These lectures, open to the public, concern themselves with "the causes of justice and the rights and dignity of man." Previous Louis Dembitz Brandeis Memorial Lecturers have been United States Supreme Court Associate Justices Felix Frankfurter and William O. Douglas, Irving Dilliard of the St. Louis *Post-Dispatch*, the Honorable

## THE ROLE OF THE UNIVERSITY

Charles E. Wyzanski, Jr., United States District Judge for Massachusetts, the Honorable William Henry Hastie, Judge of the Third United States District Court of Appeals, Earl Warren, Chief Justice of the United States, and Paul A. Freund, Carl M. Loeb University Professor, Harvard University.

### LUDWIG LEWISOHN MEMORIAL LECTURES

Sponsored by students of the University in tribute to their late teacher, the series has presented Stanley Edgar Hyman, Randall Jarrell, Alfred Kazin, Malcolm Cowley, Maxwell Geismar, Cleanth Brooks, Robert Graves, Marianne Moore, Robert Frost, Archibald MacLeish, E. E. Cummings, Robert Lowell and Pierre Emmanuel.

### ABBA EBAN LECTURESHIPS

Through the generosity of Nathan Straus of New York, a Fellow of the University, a generous endowment has been established named for the former Ambassador from Israel to the United States and its representative at the United Nations. The income is to provide for an annual lecture on the Brandeis campus by an outstanding statesman or scholar on some phase of Middle Eastern affairs.

## Other Cultural Opportunities

The favorable location of Brandeis University enables its students to enjoy both the charm of rustic New England life and the advantages of metropolitan Boston.

Outstanding musical events are offered at Symphony Hall, home of the Boston Symphony Orchestra, at the Boston Opera House and at Jordan Hall. Valuable art collections and interesting exhibits are found in the Boston Museum of Fine Arts, the Isabella Stewart Gardner Museum, the Boston Public Library, and the Boston Institute of Contemporary Art. Students are urged to attend the lectures and forums constantly scheduled in the city.

Opportunities for entertainment are also plentiful. With more legitimate theatres than any city in the nation except New York, Boston is often host to new plays before they are taken to Broadway. The ballet, the opera and other similar events are equally accessible.



## General Description

Brandeis University, on the southwest outskirts of Waltham, Massachusetts, is ten miles west of Boston, adjacent to Wellesley and near historic Lexington and Concord.

From the eastern Charles River boundary, University grounds sweep upward to New England's famed Boston Rock, where Governor Winthrop and his Massachusetts Colony explorers first surveyed the region that is today Greater Boston.

By automobile, the campus may be reached from Boston on Commonwealth Avenue (Route 30); from Exit 45 of Boston's encircling Route 128; or from Exit 14 of the east-west Massachusetts Turnpike. Road signs at the Route 30 rotary, just west of the Route 128 overpass, point to Brandeis University. Watertown cars run from Park Street subway stations in Boston to Newton Corner, where a Roberts-Riverside bus may be taken to the campus on South Street in Waltham. This same bus also connects with Riverside cars from Park Street Station in Boston.

### Academic and Administrative Centers

#### FORD HALL

Near the central campus, Ford Hall contains classrooms, laboratories, faculty offices, and Seifer Hall, an auditorium seating approximately 500, which is used for lectures and evening sessions of the Institute of Adult Education.

#### SYDEMAN HALL

This annex to Ford Hall houses laboratories, classrooms and faculty offices.

#### HAYDEN SCIENCE QUADRANGLE

The Charles and J. Willard Hayden Quadrangle, comprising several acres in the central campus area, is the site of the major science facilities of the university. This quadrangle was designated as a memorial to two generous benefactors whose gifts were intended to stimulate the science research program of the University.

#### KALMAN SCIENCE CENTER

Dominating the central campus, this center contains instructional and research facilities for the undergraduate School of Science, and for advanced work in the Graduate School. Two thirds of the walls are glass, allowing maximum natural light into classrooms and laboratories.

#### FRIEDLAND RESEARCH CENTER

Adjacent to Kalman Science Center and duplicating its modern construction, is the Friedland Life Science Research Center. This four-story building houses laboratories and scientific equipment for research in Biochemistry and related fields of science.

#### RABB GRADUATE CENTER

This unique structure includes seminar rooms, a circular glass-walled lounge, and Graduate School faculty. Air conditioned, the center serves also for the Brandeis University Summer School.

## GENERAL DESCRIPTION

### SLOSBERG MUSIC CENTER

A major structure of the School of Creative Arts, this center contains classrooms, office studios, practice rooms, a music library, recording-transcription alcoves, and a recital hall seating 250. A central skylighted gallery displays changing exhibits of the University art collection, as well as various University sponsored art exhibits.

### ADMINISTRATION CENTER

Located near the main entrance to the campus, the Brandeis University Administration Center houses the offices of the President, Deans, student administration, University administration, and the National Women's Committee. In addition to offices, the Center contains such facilities as conference rooms, the University's Service Bureau and a meeting room for the Board of Trustees. The Center includes the Bernstein-Marcus Hall, the Gryzmish Building and the Irving Executive Center.

### THE OLD LIBRARY BUILDING

The former University Library, a brick and fieldstone structure located in the center of campus, is being reconverted to house the University Bookstore, the Post Office, and student organization offices.

### ULLMAN AMPHITHEATRE

Utilizing a natural bowl below the grape arbor, the Amphitheatre has a complete stage with full lighting equipment and orchestra pit, several classrooms and a faculty office. It is the present center of student theatre activity, and scene of the University's Festivals of the Creative Arts.

### GOLDFARB LIBRARY BUILDING

Just completed on the north campus is the new Goldfarb Library Building, a brick, limestone and glass structure with an ultimate capacity of 700,000 volumes. On the periphery of the open stacks are student carrels and faculty studies for the Schools of Humanities, Social Sciences, Creative Arts and Science. Seminar rooms are provided for those courses requiring intimate and immediate contact with library resources in specific research and reference areas. The library also contains centralized audio-visual aids, journals reading rooms, typing rooms and lounge facilities. Displayed throughout the building are works of art from the University collection.

### RAPAPORTE TREASURE HALL

An adjunct to the Goldfarb Library, and connected to it by a large, glass-enclosed lobby, the Rapaporte Treasure Hall is the depository for rare books, incunabula, and other library treasures included in the University's growing collection.

### FACULTY CENTER

Recently completed on the south campus is the Faculty Center, containing club facilities, faculty lounges, a major dining room, private dining rooms for faculty meetings, and apartments for visiting faculty and lecturers.

## GENERAL DESCRIPTION

### WOODRUFF HALL

Situated in the center of the campus, this white brick building houses the Florence Heller Graduate School for Advanced Studies in Social Welfare.

### BROWN TERRARIUM

Adjacent to Sydeman Hall, Brown Terrarium is a fully-equipped, glass-enclosed green house devoted to botanical research.

### MEMPHIS TRACT

A twenty-six acre area east of South Street, Memphis Tract contains to date the Shapiro Athletic Center, Marcus Playing Field, Gordon Field and Rieger Tennis Courts.

### SHAPIRO ATHLETIC CENTER

This center contains classrooms, art studios, offices for faculty and physical education staff, as well as physio-therapy, team and dressing rooms. The main gymnasium has provisions for basketball, volleyball, and other indoor sports. The building is also used for lectures, dances and art exhibits.

### MARCUS PLAYING FIELD

This area, with its regulation baseball diamond, bleachers and practice football field, is the scene of spring baseball games, as well as informal competitions among both student and faculty groups.

### GORDON FIELD

The University's varsity football field contains the main gridiron, bleachers for several thousand, and a fully equipped press box.

### RIEGER TENNIS COURTS

The newly completed Rieger Tennis Courts are used for informal as well as inter-collegiate competition in tennis.

## Undergraduate Residence Centers

### HAMILTON QUADRANGLE

Consisting of Shapiro, DeRoy, Renfield and Usen Residence Halls, and the Sherman Student Center building, this is the main women's housing and recreational area. Each unit provides functionally equipped rooms with maximum living and closet space. Ground floor lounges look out on the landscaped quadrangle, centered by the Anne J. Kane Reflecting Pool.

### NORTH QUADRANGLE

Completed in September 1959, the North Quadrangle is a new residence area for men students. Four dormitories and a large student commons and dining hall

## GENERAL DESCRIPTION

building surround a landscaped quadrangle. Each dormitory unit contains fully equipped student rooms, a lounge and a large recreation room. One of the dormitories has been designated as Cable Residence Hall.

### RIDGEWOOD QUADRANGLE

Emerman, Fruchtman, Danciger, Allen and Rosen Residence Halls comprise one of the University's basic living areas for men. Each hall has two lounges facing the quadrangle.

### THE CASTLE

An imposing structure designed after medieval architecture and completed some time before Brandeis University came into being, the Castle has been remodelled into single, double and larger rooms for women.

### SCHWARTZ HALL

This companion structure to the Castle houses 26 women. The lounge, a retreat for reading, relaxation and entertainment, is furnished in contemporary style.

## Recreation Centers

### SHERMAN STUDENT CENTER

The two-storied glass wall of this rust brick structure overlooks the pool and gardens of Hamilton Quadrangle. On the first level, a dining hall serves hundreds of students each meal and doubles as a banquet hall for major dinners. The top level includes a large lounge, game room, a smaller lounge and two dining rooms for private meetings. Bulletin boards of these rooms serve as a major communications center for student activities, and the walls are frequently hung with special art exhibits. Student dances, parties and meetings often occupy the entire building on busy evenings.

### FELDBERG LOUNGE

Spacious and comfortable, this glass and brick walled lounge occupies the major portion of the Sherman Student Center upper level. It is used for informal discussions, lectures, songfests and conferences, and is a favorite meeting place for students between classes. Throughout the year, works by student and professional artists are exhibited here.

### MAILMAN STUDENT CENTER

This striking glass, brick and granite structure provides a spacious lounge primarily for Ridgewood Quadrangle students, a modern recreational room, and lockers for commuting students. Broad windows and terraces look out on Ridgewood Quadrangle, Slosberg Music Center and the landscaped wooded area gracing the southwest campus.

### USEN COMMONS

This circular conservatory style lounge, on the second story of the Castle, is a popular gathering place during leisure hours. Ideal for small dances and social functions, its furnishings include a piano, club chairs, divans, desks and bridge tables. The Commons also contains a portion of the University art collection.



## GENERAL DESCRIPTION

### Dining Halls

University dining halls are located in the North and Sherman Student Centers. A separate kitchen is maintained in the Sherman Center for those wishing special dietary meals. In addition, light refreshments are provided in the Castle snack bar, popular among students and faculty.

### Stoneman Infirmary

On the forward slope of the campus near the Castle, the Infirmary houses a first aid treatment room, lounge, out-patient clinic, four consulting suites, and rooms for sixteen bed patients.

### Ford Psychological Counseling Center

Situated in the quiet of Ridgewood Terrace, this center is maintained as a service to Brandeis University students.

### The Three Chapels

Assuming that worship is a matter of mood and spiritual climate, not limited to words or ceremonies, Brandeis University's Harlan, Berlin and Bethlehem Chapels serve the Protestant, Jewish and Catholic faiths. A unifying altar serves a large outdoor area where shared functions such as Baccalaureate are celebrated. Student organizations responsible for services are Hillel Foundation, Newman Club, and Student Christian Association, each with its own chaplain.

### Projected Facilities

#### BROWN SOCIAL SCIENCE CENTER

Under construction adjacent to the Graduate Center, the Brown Social Science Center will include three structures, all connected by enclosed passageways.

The Morris Brown Social Science Hall will house the Sociology, Anthropology, Psychology and Economics Departments. It will contain classrooms, seminar rooms, faculty offices, laboratories and an anthropology museum.

The David Schwartz Teaching Center will include a lecture auditorium to seat 330, classrooms, and a lounge for the entire Social Sciences center.

Samuel Lemberg Hall will include the University's child psychology center and will provide teaching and office space for the Florence Heller Graduate School for Advanced Studies in Social Welfare.

#### SHIFFMAN HUMANITIES CENTER

This center will introduce a new academic concept. Classroom lounges will be devoted to various areas of the humanities, with original manuscripts, portraits, and source material relating to the courses offered. Lounges are planned for study areas in the Classics, English, German, Renaissance, Romance, Slavic, American, Phonetics and Philosophy.

## GENERAL DESCRIPTION

### OLIN-SANG AMERICAN CIVILIZATION CENTER

This center will contain a series of classroom halls around which will be placed original manuscripts, portraits and source materials relating to the courses offered. Planned to date are Four Freedoms, Lincoln, and Washington Halls, with those remaining to be devoted also to persons, periods and developments of American Civilization. This building, like the Humanities Center, will be located northeast of the Brandeis Three Chapels Interfaith Area.

### GOLDING JUDAIC CENTER

This Center will also be located northeast of the Three Chapels area and adjacent to the Shiffman Humanities Center. Its classroom halls will be devoted to the study of the Near East, Judaics and related subjects. Included will be a sizable lecture hall and faculty offices.

### SPINGOLD THEATRE ARTS CENTER

This center will be a major facility on the campus. In addition to a 450 seat theatre, the building will contain workshops, design rooms, costume preparation and storage areas, seminar rooms, classrooms, faculty offices, rehearsal and dressing rooms, a little theatre, and a dance studio. It will be equipped with all facilities necessary for the teaching of all aspects of the theatre arts. The lobby will be designed to contain art treasures. The Theatre Arts Center will be located in the west part of the campus which has been set aside for the future development of the University's creative arts teaching facilities.

### ROSE ART CENTER

The Rose Art Center is being planned to serve as a central point for housing the art treasures of the University. To be located within the proposed Creative Arts area, this building will offer protection as well as an attractive setting for the growing collection of the fine arts now owned by the University, including the distinguished Rose collection itself. In years to come, this Art Center will take its place among the distinguished collections of the arts already located in the museum-rich Greater Boston Area.

# THE GRADUATE SCHOOL OF ARTS AND SCIENCES

## History and Organization

The Graduate School of Arts and Sciences was formally established in 1953 when the Board of Trustees of Brandeis University authorized graduate study in the areas of Chemistry, Music, Psychology, and Near Eastern and Judaic Studies. The first Master of Arts degree was conferred in 1956, the first Master of Fine Arts degree in 1956; and the first Doctor of Philosophy degree in 1957.

The general direction of the Graduate School is vested in a Graduate Council of the Faculty composed of the President and the Dean of Faculty, *ex officio*; the Dean of the Graduate School; and one representative, usually the Chairman, of each of the several Departments and Committees of the University offering graduate instruction. The members of the Graduate Council from Departments and Committees are appointed by the President on the recommendation of the Dean of the Graduate School. The functions of the Graduate Council, exercised in consonance with University policy, are to determine requirements for admission; to provide programs of study and examinations; to establish and maintain requirements for graduate degrees; to approve candidacy for degrees; to make recommendations for degrees; to make recommendations for new graduate areas of study; to lay down such regulations as may be considered necessary or expedient for the governance of the Graduate School; and to exercise a general supervision over its affairs. The Dean of the Graduate School is the Chairman of the Graduate Council and the chief executive officer of the Graduate School.

## Objectives

The underlying ideal of the Graduate School is to assemble a community of scholars, scientists and artists, in whose company the student-scholar can pursue studies and research as an apprentice. This objective is to be attained by individualizing programs of study, restricting the number of students accepted, maintaining continual contact between students and faculty, and fostering the intellectual potential of each student.

Degrees will be granted upon the evidence of intellectual growth and development, rather than solely on the basis of formal course credits. Fulfillment of the minimum requirements set forth below cannot, therefore, be regarded as the sole requisite for degrees.

## Areas of Graduate Study

During the academic year 1959-1960, graduate programs will be offered in the following areas:

- |                                    |                                     |
|------------------------------------|-------------------------------------|
| 1. Anthropology                    | 7. History of Ideas                 |
| 2. Biochemistry                    | 8. Mathematics                      |
| 3. Biology                         | 9. Mediterranean Studies            |
| 4. Biophysics                      | 10. Music                           |
| 5. Chemistry                       | 11. Near Eastern and Judaic Studies |
| 6. English and American Literature | 12. Physics                         |
| 13. Psychology                     |                                     |

Details of the programs and courses offered in these areas are given below. In succeeding years, the graduate program will be extended to cover other areas.

The Board of Trustees of the University has authorized a graduate program in Sociology commencing with the academic year 1960-1961.

Graduate study in social welfare is offered by the Florence Heller Graduate School for Advanced Studies in Social Welfare. For information concerning this area of study, see the catalog of that School.

## Graduate School Office

The Graduate School Office is located in the Gryzmish Academic Administration Building, Rooms 101 and 102. The Office is open Monday through Friday from 9 A.M. to 5 P.M. All requests for information, catalogs and application forms should be addressed to the Dean of the Graduate School of Arts and Sciences, Brandeis University, Waltham 54, Massachusetts.

## Admission

As a general rule only well qualified men and women who have completed the normal four-year program leading to the Bachelor's degree will be considered for admission to the Graduate School. Graduates of foreign schools and others who have completed the equivalent of a Bachelor's degree program may apply, describing the educational program they have completed.

Applicants for admission to the graduate areas in Biochemistry, Biophysics, and Psychology are required to take the Graduate Record Examination, including the Aptitude Test portion, and preferably one Advanced Test in a field related to the proposed area of graduate study. Applicants for admission to the graduate area in Psychology must also take the Miller Analogies Test. All other applicants for admission are urged to take the Graduate Record Examination. Information concerning the Graduate Record Examination is available from the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey, or P. O. Box 27896, Los Angeles 27, California. At the time of printing, testing dates were not available. The tests are ordinarily given in November, January, April and July with a two-week notification period required.

Specific requirements established by each area of study are to be found below. Each applicant should consult these requirements prior to filing an application. One who seeks admittance to the Graduate School should write to the Dean of the Graduate School of Arts and Sciences, stating which area of study he or she wishes to pursue. A catalog and appropriate forms will be forwarded to the applicant. The "Application for Admission" and, if needed, the "Application for Financial Aid" should be completed and returned as soon as possible. The closing date for receipt of applications for admission is March 1, although exceptions may be made. Applicants requesting financial aid should file as early as possible. Applications for admission for the Spring Semester must be filed by December 15. It is not always possible to admit students at mid-year in all Departments. Students entering at mid-year are not normally eligible for financial aid.

The applicant is required to arrange for the forwarding of official transcripts of all undergraduate work and graduate work, if any. In addition, he must have forwarded, on forms provided by the Graduate School, two letters of recommendation, preferably from professors with whom the applicant has studied in



the field of his proposed area of study. An applicant who has engaged in graduate study elsewhere should request at least one of the recommendations from a professor with whom he has done graduate work.

Applicants for admission to the Graduate Departments of Music and of English and American Literature should also submit a sample of their written work.

All applications for admission must be accompanied by an application fee of \$5.00, payable by check or money order to Brandeis University. No applications will be processed until this fee is paid.

All applications are considered on a competitive basis. The number of students who can be admitted each year in each Department is limited so that the Graduate School may operate effectively under its distinctive principles of individualized study and apprenticeship. Consequently admission may sometimes be denied to qualified persons. The minimum standards of admission merely determine whether the applicant will qualify for a place in the group from which final selections will be made. Selections are based on the applicant's ability to do graduate work of high quality as shown by the distinction of his previous record, particularly in his proposed area of study; by the confidential letters of recommendation submitted in support of his application; and by his adaptability to the particular graduate programs offered by Brandeis University. In addition, knowledge of foreign languages, relevant practical experience in the field, samples of work, the results of the Graduate Record Examination, and indications of character, are considered. In order for the results of the Graduate Record Examination to be considered, the applicant should take the examination no later than January, 1960.

Each application for admission with all supporting records is first examined by the Department or Committee responsible for the graduate area to which the applicant seeks admittance. The Department or Committee makes a recommendation to the Dean of the Graduate School as to which applicants should be selected for admission and for financial aid. The Dean, in association with a faculty Committee on Admissions and Awards, reviews all applications in the light of departmental recommendations, and, on behalf of the Committee on Admissions and Awards, informs each applicant of the results of the competition. Applicants for admission will be notified by April 1.

A student who has been accepted for admission to the Graduate School will be notified by a letter specifying the date by which he must accept the offer of admission and awards, if any. If a student selected for admission indicates that he does not intend to accept the offer, or if he fails to reply by the date specified, his admission expires and another applicant may be accepted in his place.

Students who are accepted must provide the Graduate School Office with an official final transcript of their undergraduate record and of any graduate work that was in progress at the time of acceptance. In addition, students who are accepted are required to complete and return a Medical Questionnaire and a health insurance form which will be sent with notification of acceptance. All acceptances are conditioned upon approval by the University Health Office. All persons admitted to the Graduate School must give evidence of their physical and psychological capacity to carry on their studies.

If, after having been admitted, a student cannot attend, he should notify the Dean of the Graduate School as soon as possible. If such a student wishes to be admitted for a subsequent academic year, he must request reactivation of his application at the appropriate time and bring it up to date.

An applicant who has been denied admission may reapply in a later year, particularly if he has had further training which would strengthen his application or if he can submit additional letters of recommendation.

Admission to the Graduate School does not imply that the successful applicant has been accepted as a candidate for a graduate degree. Superior performance at Brandeis University is essential. Admission to candidacy for the M.A. or M.F.A. is granted by the Graduate Department or Committee administering the program of study. Admission to candidacy for the Ph.D. is granted by the Graduate Council upon the recommendation of the Department or Committee administering the program of study.

#### READMISSION

Admission is valid for only one academic year. A student's record is reviewed annually, and he may be denied readmission. Students completing the requirements for the M.A. or M.F.A., and students who already hold a Master's degree but who have not yet been admitted to candidacy for the doctorate, must make formal application for readmission by April 1 of each year if not requesting financial aid, or by March 1 if requesting financial aid. The application for readmission must be filed with the Graduate School Office.

### Residence Requirements

Residence requirements for all graduate degrees are computed both on the basis of time elapsed in the course of resident study and on the basis of the amount of registration for credit and the tuition charges during period of residency. Part-time students and teaching assistants pursuing part-time programs of study for credit complete their residence requirement when their fraction programs (one quarter, one half, three quarters) total the amount required of a full-time resident student for any given degree.

#### RESIDENCE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS

The minimum residence requirement for all students is one academic year at a full-time graduate credit program at the full tuition rate; or the equivalent thereof in part-time study.

#### RESIDENCE REQUIREMENTS FOR THE DEGREE OF MASTER OF FINE ARTS

The minimum residence requirement for all students is three academic semesters at full-time graduate credit program for each semester, at the full tuition rate for each semester; or the equivalent thereof in part-time study.

#### RESIDENCE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

The minimum residence requirement for all students is two academic years at a full-time graduate credit program for each year, at the full tuition rate for each year; or the equivalent thereof in part-time study.

#### CREDIT FOR WORK DONE ELSEWHERE

Graduate work taken elsewhere may not be counted toward fulfillment of the residence requirement at Brandeis University for the degree of Master of Arts, although a Department may accept work taken elsewhere in partial fulfillment of specific course requirements for the degree. Not more than one semester of residence credit for work taken elsewhere may be counted toward fulfillment of the residence requirement for the degree of Master of Fine Arts. Not more than one

year of residence credit for work taken elsewhere may be counted toward fulfillment of the residence requirement for the degree of Doctor of Philosophy.

A student admitted to a Ph.D. program at Brandeis University who has done graduate work elsewhere may file an application to have his work at that institution counted toward fulfillment of residence requirements. However, language requirements, qualifying and comprehensive examinations, the dissertation and the final oral examination, and other such requirements, must be fulfilled while enrolled at Brandeis.

To be eligible for receiving credit toward fulfillment of residence requirements for work taken elsewhere, a student must complete at least one semester's residence at Brandeis as a full-time student. He may then file an "Application for Credit for Graduate Work Done Elsewhere." The completed application should be submitted to the Graduate School Office which will advise the student of the action taken on his application. An applicant will not necessarily be given the credit he requests. Indeed, each Department reserves the right to require of any student work in excess of its minimum standards to assure thorough mastery of his area of study. In any case, every candidate for the Ph.D. degree must complete at least one year of residence at Brandeis as a full-time student, or the equivalent thereof in part-time study.

#### FULL-TIME RESIDENT STATUS

A full-time student is one who devotes his entire time, during the course of the academic year, to a program of graduate work at Brandeis University, to the exclusion of any occupation or employment. In exceptional cases, however, a student may accept outside employment with the approval of his Department Chairman.

A full-time program may include a combination of teaching and research assistance, work leading to the fulfillment of degree requirements, such as preparation for qualifying, comprehensive, and final examinations, or supervised reading and research, or the writing of M.A. theses and Ph.D. dissertations, as well as regular course work.

A full-time resident student may take as many courses for credit in any semester as are approved by his Department Chairman, but no student may receive credit for nor be charged for more than a full-time program in any semester. Thus, the minimum residence requirement for any degree may not be satisfied by an accelerated program of study nor by payment of more than the full-time tuition rate.

Ph.D. candidates and students for whom the M.A. and M.F.A. degrees are terminal degrees may continue as full-time students upon completion of their residence requirements by registering at the reduced tuition rate (see p. 35).

#### PART-TIME RESIDENT STATUS

A part-time student is one who devotes less than his entire time to a program of graduate work at Brandeis University. He may register for a credit program of one quarter, one half, or three quarters time. A part-time student may engage in outside employment with the permission of his Department Chairman, who may restrict the time permitted for such employment.

Students wishing to pursue part-time resident study leading to a graduate degree must explain in writing, at the time they seek admission, why full-time study is not possible. An enrolled student receiving financial aid from the University, who wishes to change his status from a full-time to a part-time resident, must file with the Graduate School Office an explanation of why full-time study is no longer possible.



## Special Students

On occasion, properly qualified persons who wish to take courses without working for a degree will be admitted. Special students are ineligible for financial aid by the University. A special student who subsequently wishes to change his status to that of a part-time or full-time student working for a degree must apply for admission as a resident student. He must file a special petition if he wishes credit to be awarded for any work previously taken at Brandeis as a special student. Credit for such work may be given in exceptional cases.

## Registration

Every resident student must register in person at the beginning of each semester, whether the student is attending regular courses of study, carrying on research or independent reading only, writing a thesis or dissertation, or utilizing any academic service or facility of the University. Students who have completed their residence requirements and who wish to utilize any academic service or facility of the University must also register.

There is a charge of \$10.00 if registration is not completed at the time specified in the Academic Calendar for the Graduate School.

Registration consists of the payment of all fees for the semester and the filing of a Program Card and other required forms duly filled out.

Before filing his Program Card, the student should plan his program of study in consultation with the Chairman of his Department. All courses for which the student registers for credit must be listed on the Program Card. Audited courses must also be listed, noted as "Audit," and the Program Card be signed by the instructors of such courses. Care should be taken to specify whether the program of study is full-time or part-time and if part-time whether one quarter, one half or three quarters time. A one quarter time student may not register for more than four credits per semester; a one half time student may not register for more than eight credits per semester; a three quarters time student may not register for more than eleven credits per semester. The Program Card must be signed by the student's Department Chairman before submission at registration.

Full-year courses must be listed on the Program Card at Spring Registration.

### CHANGE OF PROGRAM

Once registered, a student who wishes to add or drop a course or otherwise change his program of study must obtain the proper form for that purpose from the Graduate School Office and return it when properly filled out. Credit will not otherwise be given for the courses changed, and the student renders himself liable to a \$5.00 fine.

### REGISTRATION IN TERMS OF TIME

An advanced student, one who has completed one full year of residence, either by graduate work at Brandeis or by receiving credit for graduate work done elsewhere, may register in terms of time, subject to the signed approval of his Department Chairman. His Program Card must indicate that he is registering full time or a specific fraction thereof (one quarter, one half or three quarters).

Registration in terms of time is a device that helps to individualize programs of study and permits increased freedom for independent research for the advanced





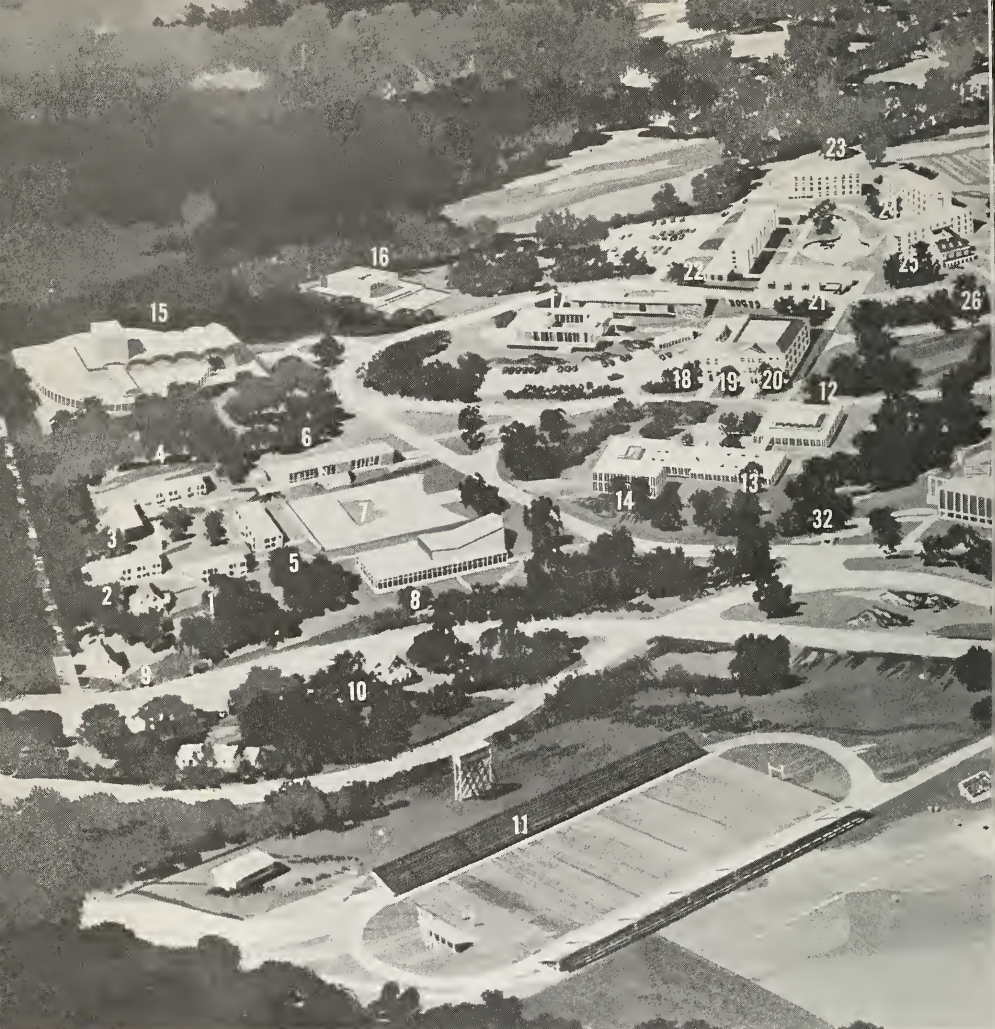
Seminars . . .

direct communication in teaching

Sherman Student Center . . .

overlooking Hamilton Quadrangle





1. Allen Hall
2. Rosen Hall
3. Emerman Hall
4. Danciger Hall
5. Fruchtman Hall
6. Mailman Hall
7. South Parking
8. Slosberg Music Center
9. Ridgewood Cottages
10. Roberts Cottage
11. Gordon Field
12. Gryzmish Academic Administration Center
13. Irving Executive Center
14. Bernstein-Marcus Hall
15. Spingold Theatre Arts Center\*

16. Rose Arts Center\*
17. The Faculty Center
18. Brown Terrarium
19. Sydeman Hall
20. Ford Hall
21. Sherman Student Center
22. Shapiro Hall
23. DeRoy Hall
24. Renfield Hall
25. Usen Hall
26. Woodruff Hall
27. Berlin Chapel
28. Harlan Chapel
29. Bethlehem Chapel
30. Old Library Building
31. Ullman Amphitheatre

\* (Projected)





formation Booth  
 Marcus Playing Field  
 Eger Tennis Courts  
 Memphis Tract  
 Shapiro Athletic Center  
 Oneman Infirmary  
 Fieldland Science Center  
 Goldman Science Building  
 Webb Graduate Center  
 Rapaport Treasure Room  
 Goldfarb Library Building  
 Schwartz Teaching Center\*  
 Town Social Science Center\*

45. Lemberg Hall\*
46. The Castle
47. Schwartz Hall
48. Shiffman Humanities Center\*
49. Golding Judaic Center\*
50. Olin-Sang American Civilization Center\*
51. North Dining Hall
52. 53. 54. North Quadrangle Residence Halls
55. Cable Hall
56. Buildings and Grounds Center

Hayden Science Quadrangle includes the University's major science buildings.  
 Memphis Tract includes the University's athletic facilities.



**Research in Biochemistry . . .**

**probes the frontiers of the life sciences**

**The central campus in spring . . .**

**New England bursts into bloom**



graduate student. Registration in terms of time frees the student to pursue a program of study that partially accepts or bypasses altogether the system of formal courses, although a student registering in terms of time will usually register for an advanced research or dissertation course. His time will be spent in such research and reading as will be most beneficial to his development as a scholar.

## Auditing Courses

The privilege of auditing courses without fee is extended to all regularly enrolled graduate students except those classified as "Special Students." Special students may audit courses by paying for them at the same rate as though they were taken for credit. No course may be audited without the permission of the instructor. An auditor is merely a listener. He may not participate in any class work, nor take examinations, nor receive evaluation from the instructor; no credit is granted for an audited course.

## Refunds, Leave of Absence, Withdrawal

### REFUNDS

The only fee which may be refundable, in part, is the tuition fee. No refund of the tuition fee will be made because of illness, absence, or dismissal during the academic year. If a student withdraws within 30 days from the beginning of classes, he may petition the Office of University Finance for a partial refund of tuition. A refund may be denied without any reason for such denial being stated.

### LEAVE OF ABSENCE

Students who have not completed their residence requirements may petition for leave of absence. The petition must have the approval of both the Chairman of the Department and the Dean of the Graduate School. Leave of absence up to one year will normally be granted to students in good academic standing who present compelling personal reasons or need to do work off campus in connection with their graduate studies.

### WITHDRAWAL

A student who wishes to withdraw from the Graduate School at any time before the end of the academic year must give immediate written notice to his Department Chairman and to the Dean of the Graduate School on a form provided by the Graduate School Office. Failure to comply with this procedure for withdrawing may subject the student to dishonorable discharge, refusal of readmission, cancellation of the privilege of securing an official transcript of his record, and, in the case of a student withdrawing within thirty days of the beginning of classes, loss of eligibility for partial refund of tuition. Such a student must pay tuition for the full semester. Permission to withdraw will not be granted if the student has not discharged all financial indebtedness to the University or has not made arrangements for subsequent payment to the satisfaction of the Office of University Finance.

## Dismissal or Expulsion

The University reserves the right to revoke, cancel, or reduce at any time any financial or honorific award made to any graduate student, for conduct or aca-



demic standing or financial indebtedness regarded by the University as undesirable, and without assigning any further reason therefor; neither the University nor any of its Trustees or officers shall be under any liability whatsoever for its disciplinary action, revocation or reduction of any award, or dismissal or expulsion.

## Grades and Course Standards

Graduate students will be expected to maintain records of distinction in all courses. Letter grades will be used in all courses in which grading is possible. In thesis or research courses, if a letter grade cannot be given at the end of every semester or academic year, "Credit" or "No Credit" may be used. "No Credit" and any letter grade below B minus are unsatisfactory grades in the Graduate School. A course in which the student receives an unsatisfactory grade will not be counted for graduate credit. At the end of each academic year, the Graduate School will issue to all registered students a report of their grades and of degree requirements that have been satisfactorily completed.

## Incompletes

A student who receives a grade of "Inc." (incomplete) must satisfactorily complete the work of the course in which the "Inc." was given in order to receive credit for the course and a letter grade. An "Inc." must be made up no later than the end of the following term in which it was received, or prior to that time the student must file with the Graduate School Office a petition for an extension of time signed by both the instructor in the course and by the Department Chairman.

## Financial Assistance

To help students whose records indicate scholarly promise, the University makes available a variety of awards and work opportunities. No student is eligible for aid unless he files with the Graduate School Office an "Application for Financial Assistance" by March 1. In exceptional circumstances applications received from prospective students later than March 1 may be given consideration. All scholarships and fellowships are granted for one academic year. Therefore, a registered student who holds a scholarship or fellowship must apply for a renewal by filing the "Application for Financial Assistance" by March 1.

The following opportunities are available:

### SCHOLARSHIPS

A scholarship is an award, on grounds of scholarly ability and need, of financial credit that may be used exclusively for remission of tuition fees. Full scholarships in the value of \$1,250.00 and partial scholarships are available. Scholarship students are liable for all fees, but tuition fees in the amount of a scholarship award shall not be charged.

### FELLOWSHIPS

A fellowship is an academic award of honor to outstanding students to help them in the furtherance of advanced study and research. Fellowships carry stipends ranging up to \$2,000.00. The amount of the stipend depends upon the quality of the student's record and performance; need is also considered in most cases. A



fellowship recipient must pay tuition fees unless also awarded a scholarship in an amount covering tuition. No services are required of students for fellowship or scholarship awards.

No student may hold a fellowship or scholarship for more than two years of study for the M.A. degree, for more than three years of study for the M.F.A. degree, or for more than four years of study for the Ph.D. degree. No student may receive a scholarship or fellowship after one year of study at the reduced tuition rate. Part-time students are ineligible for fellowship awards and are not ordinarily considered for scholarship awards. Teaching assistants who are part-time students may apply for scholarships. Priority in making awards is given to full-time students and teaching assistants. Awards are recommended by Department Chairmen to a faculty committee of which the Dean of the Graduate School is Chairman. Awards are granted and accepted with the understanding that they may be revoked or reduced at any time for conduct or academic standing that may be regarded as undesirable.

### TEACHING ASSISTANTSHIPS

Teaching assistants are resident students in the Graduate School who do part-time teaching as part of their training and are paid a stipend in return for services rendered. The University has established teaching assistantships to enable distinguished graduate students to gain teaching experience while continuing their studies. Stipends, which vary with the hours of teaching and degree of responsibility, may reach a maximum of \$2,400.00. Stipends do not include tuition or other fees, but teaching assistants are eligible for other awards.

A full-time student who is a teaching assistant receives residence credit for, and is charged tuition for, that fraction of his program spent as a student in fulfillment of degree and residence requirements. No teaching assistant may carry more than a one-half time teaching assignment. A quarter-time teaching assignment consists of about six hours of laboratory supervision per week or three hours of classroom instruction per week, or the equivalent. A graduate student who has not completed his residence requirement and is assigned to a quarter-time teaching assignment must register for a three quarter program of study for credit in order to be considered a full-time student. A student who has not completed his residence requirement and is assigned less than a quarter-time teaching assignment must register for a full-time program of study to be considered a full-time student. A teaching assistant may receive a larger stipend for a teaching assignment greater than one-quarter time, but he is not regarded as having a half-time teaching assignment unless he is assigned twice the normal work load that is the standard for quarter-time teaching. A half-time teaching assignment requires that the student who has not completed his residence requirement must register for a half-time program of study for credit in order to be considered a full-time student. Ordinarily, only graduate students who have completed their residence requirement will be considered eligible for half-time teaching assignments. A student who needs to register for only a partial program of study to complete his residence requirement and who is assigned a teaching assistantship is regarded as a full-time student. A teaching assistant who has completed his residence requirement and registers as a full-time student at the reduced tuition rate may pursue whatever program of study and research seems necessary and desirable, subject to the signed approval of his Department Chairman.

## THE GRADUATE SCHOOL OF ARTS AND SCIENCES

First year graduate students are eligible for appointment as teaching assistants in the Sciences. In other areas, however, first-year students are rarely appointed. Foreign students are not normally eligible for appointment as teaching assistants in their first year of graduate work unless they have had training at another American university.

Teaching assistantship appointments are made by the President of the University on the recommendation of the Dean of the Graduate School who, in turn, acts on the recommendation of a student's Department Chairman. A graduate student who is interested in an appointment as a teaching assistant should write or see his Chairman. Appointments are made for periods of one year or one semester, but are renewable. All awards of teaching assistantships to incoming students are conditioned upon an interview with a University representative, prior to registration. The University reserves the right to terminate any appointment at any time for cause. Conduct or academic standing that is regarded as undesirable may constitute cause, but the University need not assign any reason for the termination of an appointment at any time. All teaching assistantship appointments are made and accepted with this understanding, and neither the University nor any of its Trustees or officers shall be under any liability whatsoever for the summary termination of a teaching assistantship.

In the case of any student receiving financial aid from Brandeis University, whether in the form of a teaching assistantship, scholarship or fellowship, the approval of the Dean of the Graduate School is required, in addition to the approval of the Department Chairman, before the student may engage in outside employment. Approval is not normally granted in the case of full-time students receiving financial aid from the University.

### RESEARCH ASSISTANTSHIPS

Research assistantships are available in the Science areas only. Application should be made to the Chairman of the Department or Committee administering the graduate program.

### LOAN FUNDS

Applications for loans, available after one year of residence, may be made to the Office of University Finance of the University, with the approval of the Dean of the Graduate School.

### RESIDENT COUNSELLORSHIPS

Resident counsellorships, providing room, board, and remission of tuition, are available to both men and women. Interested applicants should apply to the Dean of the Graduate School no later than April 1. Appointments are made by the Dean of Students on the recommendation of the Dean of the Graduate School.

### EMPLOYMENT

On occasion the University offers part-time employment to specially trained personnel. Inquiries should be addressed to the Personnel Office of the University.

## Fees

All fees are payable on the dates respectively due. In exceptional cases, students may make prior arrangements with the Office of University Finance for in-

stallment payments. Any outstanding indebtedness to the University must be paid by a candidate for a degree by the first day of June prior to Commencement, or the candidate's name will be stricken from the rolls of degree candidates.

The payment of tuition fees and other fees due on the day of registration is part of the registration process. A student who is not prepared to pay such fees on the day of registration and who has not made alternative arrangements for payment, with the approval of the Office of University Finance, will be refused the privilege of registration. A registered student who defaults in the payment of indebtedness to the University shall be subject to suspension, dismissal, and refusal of a transfer of credits or the issuance of a transcript. No student who has been suspended or dismissed for nonpayment of indebtedness to the University may be reinstated until payment of all indebtedness.

*Application fee: \$5.00.* Payable by all applicants for admission at the time the Application for Admission is submitted. Checks and money-orders should be made payable to the order of Brandeis University. No Application for Admission will be processed until this fee is paid.

*Tuition:* The fees for tuition in the Graduate School are as follows:

Full-time resident students: \$1,250.00 per year, or \$625.00 per semester.

Part-time resident students and teaching assistants:

<i>Per Semester</i>	<i>Per Year</i>	<i>Fraction Program of Study</i>
\$470.00	\$940.00	Three-quarters
\$310.00	\$620.00	One-half
\$155.00	\$310.00	One-quarter

Special Students: \$155.00 per course per semester.

*Reduced Tuition Fee:* Students who have completed their residence requirements and who wish to continue in residence for the purpose of utilizing any academic service or University facility must register at the reduced tuition fee of \$250.00 per year or \$125.00 per semester. Students who continue to utilize any academic service or University facility after having completed residence, but who have failed to register, are subject to disciplinary action by the Dean of the Graduate School. A student who is eligible for registration on the reduced tuition basis may file a Program Card for full-time study, in terms of courses or in terms of time or any combination thereof, if his Department Chairman approves of the program of study as being a full-time program and signs the Program Card.

*Mixed Tuition Fee:* In the event that a student needs to register for only a part-time program (one quarter, one half, or three quarters) in order to complete his residence requirements, but wishes to register for additional courses or take a fuller program of study, he shall be charged for the part-time program needed to complete his residence, plus the reduced tuition fee.

*Late Registration Fee: \$10.00.* Payable for failure to complete registration at the time announced by the Graduate School Office. (Consult the Academic Calendar.)

*Change-of-Program Fee: \$10.00.* Payable by any graduate student who wishes to change his program of study later than two weeks after the first meeting of classes in each semester.

*Continuation Fee: \$10.00.* Payable annually by graduate students who have completed residence requirements and who are not registered during the period in which they are preparing for the completion of degree requirements. Students in this category are not eligible for leave of absence.

*Master's Fee: \$50.00.* A candidate for the M.A. or the M.F.A. who is subject to



the Continuation Fee and who submits a Master's thesis or takes a qualifying examination in any semester following one in which he has not been in residence, shall pay the Master's Fee. The fee is chargeable only once. The Continuation Fee will be applied toward payment of the Master's Fee.

*Dissertation Fee: \$250.00.* Students who are not registered for the academic year in which the dissertation is submitted are subject to this fee in that year. The Continuation Fee in that year will be applied toward payment of the Dissertation Fee. A student who submits his dissertation in final form no later than the registration period of a semester following one in which he has been in residence will not be subject to this fee.

*Reinstatement Fee: \$10.00.* Payable by a student who, after suspension or dismissal, has been reinstated with the consent of the Dean of the Graduate School.

*Transcript Fee: \$1.00.* Students, former students, and graduates who request official transcripts of their record in the Graduate School are charged \$1.00 for each copy issued, after the first one which is issued free of charge. Requests by mail for transcripts must be accompanied by a check in the correct amount, payable to Brandeis University. Resident students should pay the Cashier directly and present a receipt for payment to the Graduate School Office when requesting transcripts.

*Diploma Fee: \$10.00.* Payable by degree candidates for each degree.

*Health Insurance Fee: \$40.00.* Payment of the mandatory medical fee entitles graduate students to utilize the facilities of the Health Office and to participate in the benefits of the University Student Health Plan during the academic year. The fee is payable at registration and no portion is refundable.

*Waiver of Fee:* A waiver of the insurance requirement may be granted upon presentation by the student of a statement from his insurance company which certifies that similar coverage is in effect. This statement must be presented at the time of registration or the student will automatically be included under the University Student Health Plan and be billed \$40.00. A request for such waiver should be made by the student on the "Student Health Insurance" form mailed by the University with each notification of admission or readmission.

*Exceptions:* The University Student Health Plan is optional for Special Students. The University Student Health Plan becomes optional for degree candidates, except resident counsellors, who are citizens of the United States and have completed their residence requirements.

## Foreign Students

Graduates of foreign colleges and universities who have completed the equivalent of an American degree of Bachelor of Arts may apply for admission and for financial assistance. Foreign applicants should enclose with the official "Application for Admission" such original documents or official certified copies indicating the nature and scope of their formal educational background.

A student whose native language is not English should not apply unless he can write, speak, and understand English with enough competence to pursue a regular program of graduate study in an American university. Nor should a foreign student apply for admission unless he has the financial ability to support himself in the United States. For this purpose a sum of at least \$2,400.00 will be necessary for the nine-month academic year, exclusive of expenses for travel, summer, or vacation.

Of the large number of foreign applicants who apply annually, financial assistance is available for only a few of the outstanding. Scholarships cover only tuition costs. Fellowships and teaching assistantships are helpful in meeting subsistence expenses. But the total assistance that may be offered is sufficient to cover only a portion of the student's total expenses. A foreign applicant who has not had training in an American institution of higher learning will be at a disadvantage in competing for scholarships and fellowships. Teaching assistantships are rarely awarded to foreign applicants in their first year of graduate study, and even then, only in some of the science areas.

It would be wise for foreign applicants who are not in the United States at the time of application to seek the assistance of the Institute of International Education. The Institute has access to funds for the aid of foreign students and helps place them at suitable universities. For information, write to the Institute of International Education, 1 East 67th Street, New York 21, New York. Students from Great Britain may apply through the English Speaking Union, whose central office is in London. The Fellowship Commission of the United States Information Service and the local American Embassy have information on travel grants for foreign students. In any case, foreign applicants are advised to apply to several American universities.

An application fee of \$5.00 should accompany the foreign student's "Application for Admission." No application will be processed until the application fee is paid. A foreign student who is registering in the Graduate School for the first time or re-registering after a leave of absence must see the Counsellor for Foreign Students before registration. Upon presentation of his letter of admission and his passport, and after completing an Alien Student Registration form, the foreign student will receive from the Counsellor for Foreign Students a pass for presentation at registration. The Counsellor is prepared to assist in all matters connected with U. S. immigration regulations.

A foreign student who enters the United States on a student "F" visa is expected to register at the college or university which admitted him and is the destination for which his visa was obtained. Should a foreign student be admitted to the Graduate School of Brandeis University from another American university, he must visit the District Immigration Office in the area of the school from which he is transferring and present a letter from that school stating that he has been successfully pursuing a full course of study and that there is no objection to the transfer. He must also present his acceptance letter from the Graduate School of Brandeis University.

Employment may be granted to an "F" visa student during the school year in three situations: (1) if he has been granted permission for on-campus employment as a condition of admission, as indicated on the original Form I-20 provided by the University; (2) if his employment consists of practical training in his field of study; or (3) if his financial situation has changed since his admission, and he has been granted permission for employment, with the approval of the University, by the Immigration and Naturalization Service. Each year the Immigration and Naturalization Service delegates to the University the privilege of granting permission, on the basis of economic necessity, to "F" visa students for employment during the summer vacations. Permission for employment cannot be granted to Exchange-Visitor "J" visa students, unless the employment is practical training that is part of the program of instruction.

The Counsellor for Foreign Students is Mr. C. Ruggles Smith, whose office is located in the Bernstein-Marcus Hall of the Administration Center, Room 221.

## Housing

The University does not offer graduate housing facilities. The Housing Office, however, attempts to serve as a clearing house for rooms and apartments available in Waltham and nearby Greater Boston communities.

## Dining Facilities

Graduate students may sign for the twenty-one meal contract or the fifteen-meal contract in either the North Quadrangle Student Center Dining Hall or the Sherman Student Center Dining Hall. Arrangements must be made with the Steward's Office. Individual meals may be purchased at either dining hall. Light snacks are served at the Castle Snack Bar.

## Health

Payment of the medical fee entitles graduate students to utilize the facilities of the Health Office and to participate in the benefits of the University Student Health Insurance Plan.

The health insurance program helps defray expenses during the academic year for treatment beyond the scope of the Health Office. A brochure outlining the details of this program may be obtained at the Health Office. It should be noted here, however, that coverage is not provided for pre-existing conditions, extraordinary cases, psychiatric cases, optical and dental services, or special materials.

Within the limitations of the insurance coverage, fees of outside doctors and hospitals will be processed for payment only when consultations or hospitalization have been authorized by the University Health Office in advance on a form provided for this purpose. The University is not responsible for off-campus medical and hospital care sought by students or their parents on their own initiative. Students are urgently requested to read the Health Office pamphlet with great care.

Every student is required to complete a Health Questionnaire (which is mailed by the University) before admission to the University. In addition, a health examination by the University physician must be taken at the appointed time early in the academic year of admission. Failure to meet this appointment will result in a fine of \$5.00.



## Degree Requirements

The following general requirements apply to the awarding of graduate degrees in all areas of study. For the specific requirements of each area of study, students should consult the appropriate section of this catalog.

### MASTER OF ARTS

In order to qualify for a Master's degree, the student must complete the equivalent of one full year of graduate study at Brandeis University, ordinarily computed at a minimum of twenty-four semester hours of approved study. Each course meeting three hours per week grants three credits per semester. Certain Departments may at their option require more than twenty-four hours of graduate study. All Departments offering Master's programs require that the candidate demonstrate a reading knowledge of at least one foreign language and pass satisfactorily a general or qualifying examination which, at the Department's discretion, may be in one or more parts and may be written, oral, or both. Where a thesis is required for the Master's degree, two copies must be submitted to the Department Chairman in final form no later than May 1. The Master's degree must be earned within four years from the inception of graduate study at Brandeis University.

For specific programs of study, language requirements, examinations, and thesis requirements, consult the section of the catalog dealing with the proposed area of study.

### MASTER OF FINE ARTS

In order to qualify for the degree of Master of Fine Arts in Music, the candidate must complete with distinction thirty-six semester hours of work at the graduate level, and must meet the language and other requirements for the degree outlined on pages 80-82. Two bound copies of the thesis must be submitted by May 1 of the year in which the degree will be received. The Master of Fine Arts degree must be earned within five years from the inception of graduate study at Brandeis University.

### DOCTOR OF PHILOSOPHY

In order to qualify for the degree of Doctor of Philosophy, a student must ordinarily complete a minimum of three years of graduate study, including two full years of residence and a third year devoted to the preparation of a doctoral dissertation. Under certain conditions, credit for advanced standing will be granted for work taken in residence in graduate schools of other universities. Each Department or Committee reserves the right to require prospective candidates for the degree to perform work in excess of its minimum standards to assure thorough mastery of the area.

Prospective candidates, except in Psychology, must demonstrate proficiency in at least two foreign languages. In all areas of study, the student must satisfactorily pass a general or qualifying examination which, at the Department's discretion, may be in one or more parts and may be written, oral, or both. In addition, all prospective candidates must write a doctoral dissertation and defend it in a final oral examination.

To be eligible for the receipt of the Ph.D. degree in any given year, the student must have (1) been admitted to candidacy for the doctorate, (2) completed all residence requirements, and (3) passed all language examinations before the close of the first term of the year in which the degree is to be conferred. In addition, notification that the doctoral dissertation has been approved and that the dis-

## THE GRADUATE SCHOOL OF ARTS AND SCIENCES

sertation examination has been passed must have been communicated to the Dean of the Graduate School no later than May 15 of the year in which the degree is to be conferred. The Doctor's degree must be earned within eight years from the inception of graduate study at Brandeis University.

For specific programs of study, language requirements, examinations, and dissertation requirements, consult the section of the catalog dealing with the area of study.

### ADMISSION TO CANDIDACY

A student who (a) has demonstrated a knowledge and mastery of the subject matter of his field at a level satisfactory to his Department or Committee, and (b) has indicated a capacity for independent research of high quality may, at the recommendation of the Department or Committee, be admitted by the Graduate Council to candidacy for the degree of Doctor of Philosophy.

### DISSERTATION AND FINAL ORAL EXAMINATION

Three copies of the doctoral dissertation should be submitted to the Department or Committee Chairman. The Chairman will then appoint two readers besides the principal supervisor to read the candidate's dissertation. Certification of the approval of the dissertation by these readers will be communicated to the Dean of the Graduate School and the Chairman of the Department or Committee. The Chairman will then schedule a final oral examination\* and notify both the Dean of the Graduate School and the candidate of the time and place of the examination.

The final oral examination shall take place no earlier than two weeks after approval of the dissertation by the readers, during which time the dissertation will be deposited in the Office of the Graduate School, where it will be available to the faculty.

The Examination Committee, appointed by the Department, must be composed of at least three members of the faculty. The final oral examination will be open to any member of the faculty engaged in graduate instruction and invited faculty members from other institutions.

The examination may be restricted to a defense of the dissertation or may cover the whole field of the dissertation. The candidate will be notified by his Department or Committee of his responsibility for coverage at the examination.

A report, signed by the Examination Committee, certifying the candidate's successful performance on the final oral examination, will be submitted to the Dean of the Graduate School no later than May 15 of the year in which the degree is to be conferred.

### APPLICATION FOR GRADUATE DEGREES

Candidates for the M.A., M.F.A., and Ph.D. degrees must file with the Graduate School Office an application for the degree no later than April 1 of the academic year in which the degree is to be conferred. Upon the written recommendation by a candidate's Department or Committee that his application be approved, his record will be reviewed by the Graduate Council which recommends him to the University Faculty for the degree. In case of failure or withdrawal from candidacy in any year, the student must reapply by filing a new application in a later year.

### DEPOSIT OF DISSERTATION

By May 20 at the latest, the candidate must deposit two copies of his finished

\*In the Department of English and American Literature, the preliminary dissertation examination may fulfill this requirement.

## DEGREE REQUIREMENTS

dissertation, including the original typescript, with the Librarian of Brandeis University, for binding. Both copies must have the signed approval of the dissertation supervisors and readers. One copy will be retained by the Library, the other by the Department. If the candidate wishes a copy bound for his personal use, he should deposit three copies. The binding costs, payable by the student, will be assessed by the Librarian.

The title page of the dissertation must bear the date and the words, "A Dissertation Presented to the Faculty of the Graduate School of Arts and Sciences of Brandeis University, Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy."

## Areas of Study and Courses

All courses meet for three hours a week unless the course description indicates otherwise. The presence of "a" in the course number indicates a half course given in the Fall term; "b" indicates a half course given in the Spring term; "aR" or "bR" indicates a course given in the Spring term which is identical with the "a" or "b" course of the same number given in the Fall term; the use of "c" after a course number indicates that the course is administered as a half course meeting throughout the year.

Half courses normally carry three credits and full courses, six. Exceptions are noted under the individual course descriptions. Additional credits are given for laboratory hours, as indicated in the course descriptions.

Students may withdraw from whole courses at the end of the Fall term only with the consent of the instructor and with the approval of the Administrative Committee, the matter of credit to be decided by the instructor and the Administrative Committee in individual cases.

The University reserves the right to make any necessary changes in the offerings without prior notice.

## Anthropology

### OBJECTIVES

The graduate program in Anthropology is designed primarily to train students at the doctoral level. The objective is to provide the student with a broad understanding of the four major fields of Anthropology—but with particular stress on Cultural Anthropology—and to prepare the student for independent research and scholarship. Accordingly, extensive field-work experience, with guidance in the field, is required and insured as an integral part of the doctoral program.

### ADMISSION

Students accepted for graduate work in Anthropology need not have an undergraduate major in Anthropology or Sociology-Anthropology. However, the student without previous training in Anthropology, if admitted, will be required to take additional courses, as determined by the Department, to complete his residence requirements. Students must also demonstrate reading knowledge in one foreign language.

### FACULTY

Professor ELIZABETH F. COLSON, *Chairman*: Central and East Africa. Northwestern United States. Social structure.

Visiting Associate Professor ALEXANDER LESSER: American Indian. Modern cultures.

Associate Professor ROBERT A. MANNERS: East Africa. The Caribbean. Southwestern United States.



## AREAS OF STUDY AND COURSES

- Visiting Associate Professor VERA D. RUBIN: The Caribbean. Southern Europe. Applied Anthropology.
- Assistant Professor STANLEY DIAMOND: West Africa. The Middle East. Social organization.
- Assistant Professor ROBERT EVANS: Linguistics.
- Assistant Professor SUZANNA W. MILES: Middle America. Oceania.
- Assistant Professor ROBERT STIGLER: Archeology of American high cultures and of the Middle East. Human biology.

## DEGREE REQUIREMENTS

### MASTER OF ARTS

Completion of twenty-four course credits, a thesis, and proficiency in one foreign language. There will be a six-hour qualifying examination for *all* students at the conclusion of the first year of study to cover the work of the first year; only those successfully passing this examination will be eligible for the M.A.

### DOCTOR OF PHILOSOPHY

*Admission to Candidacy:* Successful completion of the qualifying examination and of a general examination. The latter, which will normally be taken on completion of course requirements, will be an intensive two-hour oral inquiry covering any aspect of Anthropology, conducted by a panel of all faculty members of the Department.

*Program of Study:* Ph.D. candidates must complete forty-eight course credits beyond the A.B. and present a dissertation. No more than nine to twelve course credits with the approval of the Department may be taken in related fields.

In the first year of residence, a student will be required to take the equivalent of a full course in the ethnology of a given geographic area. By the end of two and a half years, he must have completed the following additional courses: Anthropology 102a and b, Anthropology 105a and b, Anthropology 155b, Anthropology 200.

Each student who has passed the qualifying examination with a satisfactory grade and who plans to go on towards the Ph.D. will take part in a three-month summer field training program under the direction of a faculty member.

As soon as is feasible after completion of the two and a half years of residence, the Ph.D. candidate will be expected to begin a full year of field research which will form the basis of his dissertation.

A reading knowledge of two acceptable foreign languages is required of all Ph.D. candidates. Proficiency in at least one of these languages must be demonstrated before the year of field work is begun.

The degree of Ph.D. will be awarded only after successful defense of the dissertation.

## *Courses of Instruction*

### **ANTHROPOLOGY 102a. Anthropological Linguistics**

The languages of the world. Speech communities. Phonetics, Phonemics. Morphology. Grammatical terms. Syntax. Semantics. Word formation and derivation.

## AREAS OF STUDY AND COURSES

Change of vocabulary. Borrowings. Descriptive, historical and comparative linguistics. Training in the recording and analysis of unwritten languages.

*Mr. Evans*

### **ANTHROPOLOGY 102b. Anthropological Linguistics**

Continuation of Anthropology 102a.

*Prerequisite:* Anthropology 102a.

*Mr. Evans*

### **ANTHROPOLOGY 105a and b. Problems in Human Variation**

The field of physical anthropology. The first semester will deal primarily with human evolution, the fossil record and other evidence of the emergence of *homo sapiens* from lower hominoid forms. The second semester will be concerned with the biology of the modern species, ontogeny, genetics, osteology, anthropometry, and systems of classification.

*Mr. Stigler*

### **ANTHROPOLOGY 106b. Primitive Religion**

The function, forms, and content of religion in primitive society. Various theoretical approaches to the study of primitive religion.

*Mr. Lesser*

### **ANTHROPOLOGY 107b. Applied Anthropology**

The role of the anthropological technician in industry and in programs of technical and social development.

*Mrs. Rubin*

### **ANTHROPOLOGY 111a. The Kibbutz**

A problem-oriented interpretation and analysis of the origin, culture, social and psychological structure of a representative Israeli collective.

*Mr. Diamond*

### **ANTHROPOLOGY 115a. Origin of the State**

An examination of the processes through which early States have evolved from kin-based or "tribal" societies in the primitive world. The various classic theories of the State will be considered in the light of anthropological evidence.

*Mr. Diamond*

### **ANTHROPOLOGY 119a. Modern Cultures**

Research seminar. Problems and limitations of anthropological analysis of modern cultures; the community study method and its use in dealing with complex societies. Intensive study of cases from contemporary anthropological materials.

*Messrs. Manners and Lesser*

### **ANTHROPOLOGY 119b. Modern Cultures**

Continuation of Anthropology 119a, with added use of informants from foreign areas.

*Anthropology 119a not a prerequisite.*

*Messrs. Manners and Lesser*

### **ANTHROPOLOGY 120a. Civilizations of Middle America**

The history and ethnology of the high civilizations of Middle America: archeological background and history to the Spanish Conquest.

*Miss Miles and Mr. Stigler*

### **ANTHROPOLOGY 120b. Civilizations of Middle America**

Continuation of Anthropology 120a. Maya and Aztec social organization and politics of the sixteenth century and colonial periods.

*Miss Miles*



**ANTHROPOLOGY 130a and b. Research Problems in Archeology**

A seminar for students with a developed interest in the field of archeology. Original research in Near and Middle Eastern prehistory will be undertaken.

Admission only with permission of the instructor.

*Mr. Stigler*

**ANTHROPOLOGY 150a. Problems and Methods of Documentary Analysis**

The practical use of documents, evaluation, testing validity of data, etc., for ethnographic synthesis. New World materials will be employed.

*Miss Miles*

**ANTHROPOLOGY 152a. Culture and Personality**

Universal, socio-cultural and idiosyncratic determinants of personality formation. Cultural values and behavioral regularities in homogeneous and heterogeneous societies. Evaluation of current theory and methodology.

*Mrs. Rubin*

**ANTHROPOLOGY 155b. Method and Theory in Social Anthropology**

The development of anthropological theory, major present-day trends and their relation to problems of research.

*Miss Colson*

**ANTHROPOLOGY 156b. African Political Systems: Seminar**

Research seminar on the major types of political systems found in Africa south of the Sahara.

*Miss Colson and Messrs. Manners and Diamond*

**ANTHROPOLOGY 161a. Research Seminar on American Indians**

American Indians north of Mexico as a field of contemporary research. Student participation in research on selected historical, ethnological and acculturation problems, including problems in the field of administration of Indian affairs.

*Mr. Lesser*

**ANTHROPOLOGY 161b. Research Seminar on American Indians**

Continuation of Anthropology 161a.

*Mr. Lesser*

**ANTHROPOLOGY 162a. Seminar on the Caribbean Area**

Cultural, ecological, historical and political features of the Caribbean since discovery.

*Mrs. Rubin*

**ANTHROPOLOGY 162b. Seminar on the Caribbean Area**

Continuation of Anthropology 162a.

*Mrs. Rubin*

**ANTHROPOLOGY 200. Graduate Seminar**

*Staff*

**ANTHROPOLOGY 201. Directed Studies**

Individual work under the guidance of a member of the staff, by special arrangement.

*Staff*

**ANTHROPOLOGY 202. Staff Seminar on African Studies**

Research seminar, drawing on members of various Departments.

*Prerequisite:* Permission of Department.

*Staff*

## Biochemistry

### OBJECTIVES

The graduate program in Biochemistry leading to the degree of Doctor of Philosophy is designed to equip the student with a broad understanding of the chemistry involved in biological processes and to train him to carry out independent original research. Although the student will be primarily responsible for a comprehensive understanding of biochemical phenomena, he will be encouraged to acquaint himself with the disciplines of biology and chemistry. Research and experimental projects rather than formal course training will be emphasized. However, the student will be required to register for basic biochemistry, biochemical techniques, intermediary metabolism, and biochemistry seminars. The choice of advanced biochemistry courses and those of other scientific disciplines (i.e., organic chemistry, genetics, embryology, etc.) are subject to the particular interests of the student. The choice of research programs should be in areas under investigation by the faculty; some of these fields include intermediary metabolism in normal and also tumor tissues, enzymology, immunochemistry, radiobiology, biochemical genetics, protein chemistry, plant and virus metabolism, problems in growth and differentiation, photobiology, microbial metabolism, and organic biochemistry.

### ADMISSION

The general requirements for admission to the Graduate School, given in an earlier section of the catalog, apply to candidates for admission to this area of study. Applicants for admission to Biochemistry are also required to take the Graduate Record Examination. The student's undergraduate curriculum should include some fundamental courses in biology and chemistry which will be subject to final staff approval.

### FACULTY

Professor NATHAN O. KAPLAN, *Chairman*: Intermediate metabolism. Biochemical basis of chemotherapy. Anti-enzyme action. Molecular heterogeneity of enzymes. Changes in structure of enzymes during adaptation, differentiation, mutation, and development.

Visiting Professor ABRAHAM GOLDIN: Cancer chemotherapy. Synergistic action of drugs. Biochemical effects of transplantable tumors.

Professor MARTIN D. KAMEN: Radiobiology. Photosynthesis. Energy transfer mechanisms. Cytochrome chemistry. Physical biochemistry.

Professor WILLIAM F. LOOMIS: Biochemistry of differentiation and growth with special reference to primitive animal systems. Role of  $p\text{CO}_2$  in biological systems. Relationship of hydra to single cell systems grown in tissue culture.

Assistant Professor LAWRENCE GROSSMAN: Nucleic acid metabolism in normal, tumor and virus-infected cells. Problems in biochemical replication. Action of pyrimidine analogs in chemotherapy.

Assistant Professor WILLIAM P. JENCKS: Conversions of chemical to mechanical energy. Model systems for energy transfer reactions. Involvement of energy-rich phosphate compounds in muscle metabolism.

## AREAS OF STUDY AND COURSES

- Assistant Professor MARY ELLEN JONES: Biosynthetic mechanisms. Role of carbanyl phosphate in microbial and mammalian systems. Metabolic pathways in differentiation.
- Assistant Professor ROBERT E. KANE: Mechanisms of protein synthesis in cell duplication. Structure of spindle proteins in mitotic processes. Chemical embryology. Macromolecular biology.
- Assistant Professor LAWRENCE LEVINE: Immunochemistry. Action of complement and properdin. Immunological studies of protein structure. Protein replication on viruses. Antibody synthesis *in vitro*.
- Assistant Professor STANLEY E. MILLS: Immunogenetics. Effect of immune environment on animal and bacterial cells. Biochemical genetics.
- Assistant Professor RICHARD S. MORGAN: Relation of spatial (secondary) structure of biological macromolecules (especially nucleic acids) to their function. The spatial structure studies using x-ray diffraction and infra-red spectroscopy. Isolation of active ribonucleic acid fractions from cells engaged in protein synthesis with the aim of correlating structural features of these ribonucleic acids with their role in protein synthesis.
- Assistant Professor JOHN M. OLSON: Differentiation. Spectrofluorometry of living cells and extracts. Biological instrumentation. Kinetic analysis of biological processes.
- Assistant Professor GORDON H. SATO: Nutrition, culture, and metabolism of single mammalian cells. Virology and genetics of animal cells.
- Assistant Professor MORRIS SOODAK: Aspects of the metabolism of the thyroid gland. Mechanism of iodination and the mode of action of the goitrogenic drugs are being investigated in cell-free preparations of thyroid tissues.
- Assistant Professor HELEN VAN VUNAKIS: Protein structure of enzymes and viruses. Mechanisms of viral infectivity. Action of colichines. Mechanism of blood coagulation.

## DEGREE REQUIREMENTS

### DOCTOR OF PHILOSOPHY

*Admission to Candidacy*—The qualifying examinations must be passed at a level considered satisfactory for this degree. This usually takes place after the second year of graduate work.

*Program of Study*—Each doctoral candidate must satisfactorily complete the following, prior to conferring of the degree:

- 1) The fundamental courses: basic biochemistry, biochemical techniques, intermediary metabolism, radiobiology, biochemical research problems, and at least five of the biochemistry seminars.

- 2) Demonstrate a reading knowledge of French and German. One of the language requirements must be satisfactorily completed prior to the oral qualifying examination. The second language examination must be satisfactorily completed no later than six months following the qualifying examination.

- 3) An oral qualifying examination will usually come at the end of the second year, and will test the student's capacity for absorbing the information to which he has been exposed in his first two years as a graduate student. The student will

## AREAS OF STUDY AND COURSES

be held responsible for acquiring a comprehensive knowledge of biochemistry and related subjects.

4) A thesis summarizing the results of an original investigation of an approved subject which demonstrates the competence of the candidate in independent investigation.

5) A final oral examination upon the thesis.

### *Courses of Instruction*

#### **BIOCHEMISTRY 100a. Basic Biochemistry**

A chemical discussion of the basic biological problems which will include topics such as: the physical and organic basis of biochemical reactions, cell physiology, intermediary metabolism, enzyme mechanisms and kinetics, energy transformations, hormones and other regulatory factors, and the basic problems of nutrition. *5 credits.*

*Prerequisite:* One year of organic chemistry and consent of the instructor. Some background in elementary physical chemistry is recommended but not required.

*Miss Jones and Staff*

#### **BIOCHEMISTRY 101a, b. Biochemistry Techniques**

Students registered for this course will participate for a period of approximately one month in the several research programs being conducted by the staff members.

*Prerequisite:* Biochemistry 100a (may be taken concurrently). Consent of the Department.

*Mr. Kaplan and Staff*

#### **BIOCHEMISTRY 102b. Intermediary Metabolism**

The following aspects of biochemistry will be studied: metabolism of carbohydrates, citric acid cycle, fat synthesis and degradation, inorganic metabolism, amino acid metabolism, peptide and protein synthesis, metabolism of nucleic acids, vitamins, coenzymes and minerals and the respiratory chain.

*Prerequisite:* Biochemistry 100a and consent of the instructor.

*Mr. Kaplan and Staff*

Courses 200 through 212a will be offered every third year.

#### **BIOCHEMISTRY 200a. Physical Biochemistry**

The following will be discussed: kinetics of enzyme reactions, the measurement of free energy, heat and entropy values in biochemical systems, transition state theory and absolute reaction rates of enzyme-catalyzed reactions, and quantum mechanics.

*Prerequisite:* Biochemistry 100a (may be taken concurrently).

*Messrs. Kamen, Mills, and Staff*

#### **BIOCHEMISTRY 202b. Chemistry of Enzyme-Catalyzed Reactions**

An introduction to the chemistry of enzyme-catalyzed reactions as compared to the uncatalyzed or chemically-catalyzed reactions will be presented; there will be some discussion of the mechanisms through which enzymes may exert their catalytic effects.

*Prerequisite:* Chemistry 131 and Biochemistry 100a, or equivalent, taken previously or concurrently.

*Mr. Jencks and Staff*



## AREAS OF STUDY AND COURSES

### **\*BIOCHEMISTRY 203a. Immunochemistry**

The course will deal with the mode and mechanisms of antigen-antibody interaction and the application of methods for studying these reactions in the estimation and characterization of proteins and high molecular weight polysaccharides. In addition, the principles of quantitative immunochemistry will be applied in studies pertaining to naturally derived proteins with biological activity such as enzymes and toxins.

*Prerequisite:* Biochemistry 100a (may be taken concurrently).

### **\*BIOCHEMISTRY 204b. Metabolism in Relation to Function**

The biochemical aspects of the following processes will be considered: mechanisms of cellular growth, duplication and differentiation, bioluminescence, motility, viral infectivity and replication.

*Prerequisite:* Biochemistry 100a.

### **\*BIOCHEMISTRY 205a. Biochemical Genetics**

Recent advances in studies on the chemistry of inheritance will be discussed with emphasis on recombination, transformation and transduction phenomena in microorganisms. Aspects of the problem of gene function, and the enzyme formation and function, will be considered together with the contribution of microbial and animal mutants to the study of metabolic pathways.

*Prerequisite:* Biochemistry 100a (may be taken concurrently).

### **\*BIOCHEMISTRY 206b. Radiobiology**

Among the subjects to be discussed will be elementary examinations of the properties of the nucleus and elementary particles: the techniques of radioactive measurement: the effect of ionizing radiations on chemical and biological systems: the use, potentialities, and limitations of radioactive and stable isotope tracers in biology.

*Prerequisites:* Biochemistry 100a, 101a and b.

### **\*BIOCHEMISTRY 207a. The Biochemistry of Malignancy**

A discussion of the metabolic activities of malignant tissues including the leukemics will be considered in comparison with normal tissues. Emphasis will also be placed on the discrepancies occurring in glycolysis and respiration in tumor tissues, the differences in protein structure as well as a discussion of the origins of malignancy with respect to biochemical phenomena.

*Prerequisite:* Biochemistry 100a (may be taken concurrently).

### **\*BIOCHEMISTRY 208b. Comparative Biochemistry**

The differences in metabolites, metabolic intermediates, enzymes and cofactors among the various species of plants and animals will be presented. Particular attention will be given to the genesis of the more important biosynthetic and metabolic processes in the evolutionary scale. Phylogenetic variations will be related, where possible, to the environmental requirements of the organism.

*Prerequisite:* Biochemistry 100a.

\* Not to be given in 1959-60.



## AREAS OF STUDY AND COURSES

### **\*BIOCHEMISTRY 209b. Physiology of the Mammalian Cell**

Factors influencing the growth, multiplication and metabolism of animal cells grown from single cell isolations will be presented. Genetic aspects of these cells will be discussed. Studies will be summarized on the infection of these cells by animal viruses from both genetic and biochemical viewpoints. The use of animal cells grown in tissue culture as a means of obtaining animal viruses will be described.

*Prerequisite:* Biochemistry 100a.

### **BIOCHEMISTRY 210b. Protein Chemistry**

The following will be discussed: Chemical and physical properties of proteins, peptides, and amino acids; methods of determination of molecular weight, purity, and structure and isolation techniques.

*Prerequisites:* Biochemistry 100a and one year of physical chemistry.

*Miss Van Vunakis, Mr. Kane, and Staff*

### **\*BIOCHEMISTRY 211b. Chemical Embryology**

A discussion of the metabolic dynamics concerned during the embryological development of animal cells with particular reference to the relation of fine structure to protein alterations and enzyme activity.

*Prerequisite:* Biochemistry 100a.

### **BIOCHEMISTRY 212a. Neurochemistry**

The special chemistry and biochemistry of nervous tissue, both central and peripheral, will be discussed. Carbohydrate, lipid, protein, and nucleic acid metabolism of nervous tissue, nerve conduction, vision, and the effects of neurotropic agents on the enzymatic mechanisms of the brain, are among the topics which will be presented. Guest lecturers from the Boston area will be invited to discuss special problems.

*Prerequisite:* Biochemistry 100a (may be taken concurrently).

*Messrs. Kaplan, Soodak, and Staff*

## *Seminars*

One seminar will be given each semester. Reports and conferences concerned with various aspects of the following semester topics:

### **\*BIOCHEMISTRY 215a. Structure and Functional Specificity of Macromolecules**

### **\*BIOCHEMISTRY 216b. Biochemical Aspects of Differentiation and Growth**

### **\*BIOCHEMISTRY 217a. Factors Regulating Metabolic Activity**

### **\*BIOCHEMISTRY 218b. Biochemical Problems in Duplication**

### **\*BIOCHEMISTRY 219a. Mechanisms of Energy Transfer Reactions in Living Systems**

### **BIOCHEMISTRY 220a. Biochemical Basis of Chemotherapy**

*Messrs. Kaplan and Goldin*

\*Not to be given in 1959-60.

## AREAS OF STUDY AND COURSES

### **BIOCHEMISTRY 221b. Photochemical Mechanisms as Applied to Living Systems**

*Messrs. Kamen and Olson*

### **\*BIOCHEMISTRY 222b. Biochemical Aspects of Psychological Phenomena**

*Prerequisite:* Biochemistry 100a.

### **BIOCHEMISTRY 400. Biochemical Research Problems**

Independent research for the Ph.D. degree.

*Staff*

### *Journal and Research Clubs*

In addition to the formal courses announced above, all graduate students will be encouraged to participate in the Journal and Research Clubs of the Department. The Journal Club is an informal meeting of the students, staff, and postdoctorals where recent publications are discussed. The Research Club will be a general meeting of the Department in which both speakers from the Department and also guest speakers will present their current investigations.

\*Not to be given in 1959-60.

## AREAS OF STUDY AND COURSES

### Biology

#### OBJECTIVES

The graduate program in Biology is designed to give the student an understanding of the fundamental nature of living processes, and to train him to undertake original research.

The graduate program is planned primarily to train students at the doctorate level. At the discretion of the faculty, students who are not candidates for the Ph.D. degree may be granted a Master of Arts degree upon completion of a part of the required program.

#### ADMISSION

The general requirements for admission to the Graduate School, given in an earlier section of this catalog, apply to candidates for admission to this area of study. The student's undergraduate record should, ordinarily, include courses equivalent to those required of undergraduates concentrating in Biology at this institution. Students who are deficient in some of these subjects, but with otherwise superior records, may make up their deficiencies in Graduate School. In exceptional cases, students may be excused from some of these requirements. However, students with serious deficiencies must expect to be required to spend extra time in Graduate School.

It is strongly recommended that applicants take the Graduate Record Examination.

Upon being admitted to the Biology Department, each graduate student will report to the temporary graduate student adviser who will assist the student in scheduling his entrance examination in the Department, and later with his program.

#### FACULTY

Associate Professor HAROLD P. KLEIN, *Chairman*: Microbiology. Lipid synthesis. Formation of inducible enzymes.

Professor EDGAR ZWILLING: Experimental embryology. Tissue interactions.

\*Associate Professor HERMAN T. EPSTEIN: Radiation biology. Virus genetics.

Associate Professor ALBERT KELNER: Genetics. Microbial genetics. Radiation biology.

Associate Professor MAURICE SUSSMAN: Microbiology. Cellular differentiation. Microbial genetics.

Assistant Professor LIONEL JAFFE: Plant morphogenesis. Effects of polarized light.

Assistant Professor MARGARET LIEB: Genetics. Microbial genetics. Lysogenic bacteriophages.

Assistant Professor GJERDING OLSEN: Animal physiology. Endocrinology.

Assistant Professor JEROME A. SCHIFF: Plant biochemistry. Biosynthesis of chlorophyll.

Assistant Professor PHILIP A. ST. JOHN: Invertebrate physiology. Regeneration in marine worms.

\*On Leave, 1959-60.

## AREAS OF STUDY AND COURSES

### DEGREE REQUIREMENTS

#### MASTER OF ARTS

The program leading to the M.A. degree in Biology focuses primarily upon the research capability of the student. Specifically, the primary requirement for the degree is the completion of a thesis based on original laboratory work which is acceptable to the Department. In general, the preparation for an original research problem will necessitate the enrollment of a student in course work. The specific number and types of courses will vary, depending upon the ultimate research problem, and will be prescribed by the Department. However, the candidate must complete the equivalent of one full year of graduate study at Brandeis University, ordinarily computed at a minimum of twenty-four semester hours of approved study.

By the end of the first year, each graduate student will choose a specific field of interest and will apply to the Chairman of the Department for a permanent adviser to be assigned by the Department. This adviser will serve as the Chairman of a Committee of at least three Departmental staff members which will serve to advise the student on courses to be taken and to guide the student throughout the thesis problem. At the discretion of this Committee, candidates may be required to take qualifying or comprehensive examinations.

The Department also requires every candidate to demonstrate a reading ability in French or German, or another foreign language acceptable to the Department. An examination demonstrating reading ability in the foreign language must be taken prior to the completion of thesis work.

#### DOCTOR OF PHILOSOPHY

All the students are required to take a group of courses which will acquaint them with the principles and techniques of differentiation, genetics, microbiology, and physiology. Upon completion of this "core" curriculum, the student will ordinarily select for more intensive study a research field in which a faculty member is doing active research. At present these include endocrinology, microbial genetics, microbial physiology, plant physiology, radiobiology, virology, and developmental biology.

Each student will choose his specific field of interest and will apply to the Chairman of the Department for a permanent adviser to be assigned by the Department before the end of the second year. This adviser will assist the student in planning a well-balanced course program in his specific field of interest. In addition, the adviser will ordinarily be the principal dissertation supervisor for the student and will serve as Chairman of the Dissertation Examination Committee.

*Program of Study*—Each candidate is required to complete satisfactorily: 1. The basic courses: Biochemistry 100a, 102b; Biology 101a and b, 102a, 103b, 104a. 2. Not less than nine additional semester hours of courses in Biology numbered 100-290, the specific course sequence to be prescribed. 3. Additional seminar and research courses to be designated.

*Foreign Language Requirements*—The language requirements, a reading knowledge of French and German, must be met before the student is admitted to the qualifying examinations. In exceptional cases, another foreign language may be substituted with the approval of the Department. After consultation with his ad-



## AREAS OF STUDY AND COURSES

viser, the student may arrange to take the language examinations at any time. In order to demonstrate proficiency in the language examinations, the student will ordinarily be required to translate an article, or a portion thereof, selected from a contemporary scientific publication, under the direct supervision of one of the Departmental language examiners.

*Qualifying Examinations*—The qualifying examination will be given in two parts. The first part, an examination on the content of the "basic courses," will ordinarily be taken within one year of the completion of those courses. The second part, emphasizing the field of specialization, will be taken upon the recommendation of the student's permanent adviser and should be completed before active dissertation work is initiated. The dates of both examinations, which may be oral or written, will be determined after consultation of the student with his adviser. The first part of this qualifying examination will be given twice each year, in September and February, by members of the Biology Department. The second part of the examination will be given by a Committee headed by the student's permanent adviser and appointed by the Chairman of the Department.

*Admission to Candidacy*—To be admitted to candidacy, the student must have passed his foreign language and qualifying examinations.

*Dissertation*—Each student will conduct an original investigation. *It is strongly recommended that the dissertation research be deferred until the student has fulfilled requirements necessary to be admitted to candidacy.* However, with the approval of the student's adviser, research courses may be elected at any time. After admission to candidacy, a Dissertation Committee will be appointed by the Chairman of the Department to consist of at least three staff members headed by the permanent adviser of the student. This Committee must approve the candidate's subject of research, will guide his research activities toward the doctoral dissertation and, in addition, will read and evaluate the completed dissertation. After submission of the dissertation, the candidate will be expected to present the principal results of his work and its significance during an examination in defense of the dissertation.

### *Courses of Instruction*

#### **BIOLOGY 101a. General and Comparative Physiology of Animals**

After an introduction to acquaint students with current experimental findings using animal cells and tissues, the course will turn to an intensive comparison of physiological processes operating in both invertebrates and vertebrates. Particular emphasis will be placed upon coordinating and integrating mechanisms.

*Prerequisite:* Biochemistry 100a. (May be taken concurrently).

Three classroom and three laboratory hours a week. *4 credits.*

Laboratory fee: \$15.

*Mr. Olsen*

#### **BIOLOGY 101b. Plant Physiology**

After a brief discussion of the environmental variables to which plants are subjected, such as nutrition, light, temperature and water relations, the course will deal with these variables in the cellular metabolism of these organisms. Wherever possible, the interrelationships of physiology, metabolism and biochemistry

will be considered. The influence of metabolism and hormones on growth will also be discussed.

*Prerequisite:* Biochemistry 100a. (May be taken concurrently).

Three classroom and three laboratory hours a week. *4 credits.*

Laboratory Fee: \$15.

*Mr. Schiff*

### **BIOLOGY 102a. Developmental Genetics**

The nature of the genetic material and the mechanisms involved in genetic control of biological processes.

Three classroom hours. *3 credits.*

*Miss Lieb*

### **\*BIOLOGY 103b. Cytology**

Microscopic and submicroscopic organization of the cell and a study of the physiological role of cell constituents. Elements of cytochemistry.

Three classroom hours: laboratory to be arranged. *4 credits.*

Laboratory fee: \$10.

### **BIOLOGY 104a. The Cellular Basis of Development**

Phenomic variation and interaction at the cellular level will be considered. Developmental events in microbial cultures, morphogenetically complex Protista, Metazoa and Metaphyta will be analyzed in terms of the cellular mechanisms involved.

Three classroom hours: laboratory to be arranged. *4 credits.*

Laboratory fee: \$15.

*Mr. Sussman*

### **\*BIOLOGY 105b. Invertebrate Physiology**

This course will deal with a comparative study of the physiology of receptor-effector and regulatory systems in the invertebrate animals. Nervous, digestive, endocrine, muscle, osmoregulatory, respiratory and circulatory functions will be considered.

Two lectures and six laboratory hours per week. *4 credits.*

Laboratory fee: \$15.

### **BIOLOGY 106b. Plant Growth and Form**

A survey of the nature and origin of plant form: tropisms, cleavage patterns, polarity, wall structure and synthesis, growth and sex hormones, tumors, dormancy, inheritance of form, etc.

Three classroom hours: laboratory to be arranged. *4 credits.*

Laboratory fee: \$15.

*Mr. Jaffe*

### **\*BIOLOGY 110a. Principles of Evolution**

The operation in populations of genetic and non-genetic factors that bring about evolutionary changes. Natural selection, isolating mechanisms, evidences for evolution.

Three classroom hours. *3 credits.*

### **BIOLOGY 111b. Microbial Genetics**

Mutation, variation, adaptation and other aspects of genetics in bacteria, viruses and other microorganisms. Problems of nucleus-cytoplasm relationships. Population genetics.

Three classroom hours. *3 credits.*

*Mr. Kelner*

\*Not to be given in 1959-60.

**BIOLOGY 120b. Advanced Microbiology**

Enrichment and isolation of representative bacteria. Discussion of the biology of these forms.

Two classroom hours: 4 laboratory hours a week. *4 credits.*

Laboratory fee: \$15.

*Mr. Klein*

**\*BIOLOGY 124a. Virology**

Biology of plant, animal and bacterial viruses.

Three classroom hours. *3 credits.*

**BIOLOGY 131b. Experimental Morphogenesis**

The fundamentals of embryology as exemplified by the chick, amphibian, and selected invertebrates. The classical experiments of embryology will be re-evaluated by application of modern techniques of tissue dissociation, tissue cultures, etc., as well as by the original approaches.

Three classroom hours: laboratory to be arranged. *4 credits.*

Laboratory fee: \$15.

*Mr. Zwilling*

**\*BIOLOGY 141b. Physical Biology**

Physical aspects of vision and hearing; properties of membranes and muscles; nerve excitation and conduction; forces involved in biological events; introduction to radiobiology; application of physical measurements to biology.

Three classroom hours.

*Biology Colloquium*

Presentations by staff members and guest lecturers on original investigations.

*No credit*

**\*BIOLOGY 200b. Comparative Physiology**

The physiological and biochemical distinctions among living organisms will be presented and the origins of these differences will be discussed from the viewpoint of biochemical evolution. An attempt will be made to define basic metabolic processes common to all organisms as well as the evolution of special pathways in certain groups.

Three classroom hours. *3 credits.*

**\*BIOLOGY 212a. Cytogenetics**

Correlation of genetic data with chromosomal aberration. Study of classical methods and recent findings.

*Prerequisites:* Biology 102a and 103b.

Three classroom hours: laboratory to be arranged. *4 credits.*

Laboratory fee: \$10.

**BIOLOGY 214b. Experimental Methods in Microbial Genetics**

Introduction to the study of microbial variations, including spontaneous and induced mutations; recombination, transduction and other phenomena, using bacteria and bacterial viruses.

Laboratory hours to be arranged. *3 credits.*

Laboratory fee: \$20.

*Miss Lieb*

\* Not to be given in 1959-60.

**\*BIOLOGY 222a. Microbial Metabolism**

Nutrition and intermediary metabolism or microorganisms.

*Prerequisite:* Biochemistry 100a or the equivalent.

Three classroom hours. *3 credits.*

**\*BIOLOGY 223b. Experimental Methods in Microbial Metabolism**

An introduction to specialized techniques as applied to the study of microbial metabolism, including manometry, chromatography, spectrophotometry, tracer techniques, etc.

Laboratory hours to be arranged. *3 credits.*

Laboratory fee: \$20.

**BIOLOGY 245a. Selected Topics in Vertebrate Physiology**

Current research in special fields of physiology will be examined in a series of seminars. A background in physiology is necessary.

Three classroom hours a week. *3 credits.*

*Mr. Olsen*

**BIOLOGY 245b. Selected Topics in Invertebrate Zoology**

Assigned topics on the invertebrate phyla will be presented. The subjects will include embryology, regeneration, physiology, ecology and behavior. The original literature will be emphasized.

Three classroom hours a week. *3 credits.*

*Mr. St. John*

**BIOLOGY 400. Research in Genetics and Microbiology**

Laboratory hours to be arranged. Credits to be arranged.

Laboratory fee: \$25.

*Mr. Epstein*

**BIOLOGY 401. Research in Genetics and Microbiology**

Laboratory hours to be arranged. Credits to be arranged.

Laboratory fee: \$25.

*Mr. Kelner*

**BIOLOGY 402. Research in Microbiology and Physiology**

Laboratory hours to be arranged. Credits to be arranged.

Laboratory fee: \$25.

*Mr. Klein*

**BIOLOGY 403. Research in Genetics and Microbiology**

Laboratory hours to be arranged. Credits to be arranged.

Laboratory fee: \$25.

*Miss Lieb*

**BIOLOGY 404. Research in Physiology**

Laboratory hours to be arranged. Credits to be arranged.

Laboratory fee: \$25.

*Mr. Olsen*

**BIOLOGY 405. Research in Differentiation**

Laboratory hours to be arranged. Credits to be arranged.

Laboratory fee: \$25.

*Mr. Jaffe*

**BIOLOGY 406. Research in Plant Physiology**

Laboratory hours to be arranged. Credits to be arranged.

Laboratory fee: \$25.

*Mr. Schiff*

\*Not to be given in 1959-60.



AREAS OF STUDY AND COURSES

**BIOLOGY 407. Research in Invertebrate Zoology**

Laboratory hours to be arranged. Credits to be arranged.

Laboratory fee: \$25.

*Mr. St. John*

**BIOLOGY 408. Research in Differentiation and Genetics**

Laboratory hours to be arranged. Credits to be arranged.

Laboratory fee: \$25.

*Mr. Sussman*

**BIOLOGY 409. Research in Vertebrate Development**

Laboratory hours to be arranged. Credits to be arranged.

Laboratory fee: \$25.

*Mr. Zwilling*

## Biophysics

### OBJECTIVES

The interdepartmental graduate program in Biophysics, leading to the degree of Doctor of Philosophy, is designed to give the student a broad understanding of the physico-chemical nature of living processes and to train him to carry out independent research. In addition to basic courses in cellular biology, the student will be expected to obtain a broad background in the supporting disciplines of biochemistry, biology, chemistry, physics, and mathematics. After completion of this program, the student's remaining course work will be in an area of biophysics in which a faculty member is doing research. Some areas in which research is now being actively pursued are photobiology, radiobiology, virus reproduction, and muscle contraction.

### ADMISSION

The general requirements for admission to the Graduate School, given in an earlier section of this catalog, apply to applicants for admission to this area of study. Applicants are also required to take the Graduate Record Examination. The student's undergraduate program should, ideally, include organic and physical chemistry, atomic and nuclear physics, differential equations, and courses in cellular biology. Inasmuch as most students will be deficient in some respects, it is expected that deficiencies may be made up by taking the appropriate courses while in Graduate School. If a petition is approved, the successful completion of some of these courses may be credited as part of the graduate program. On being admitted to study in Biophysics, the student will be assigned to a member of the Biophysics Committee who will advise the student on a program of courses. This program should be submitted for approval to the Committee by the beginning of the second term of residence.

### FACULTY

PROFESSOR MARTIN D. KAMEN (Biochemistry), *Chairman*; Professors NATHAN O. KAPLAN (Biochemistry); HENRY LINSCHITZ (Chemistry); Associate Professors HERMAN T. EPSTEIN (Biophysics), ALBERT KELNER (Biology); Assistant Professors ROBERT E. KANE (Biochemistry), RICHARD S. MORGAN (Biochemistry), JOHN M. OLSON (Biochemistry and Physics).

### DEGREE REQUIREMENTS

#### DOCTOR OF PHILOSOPHY

The following are five areas in which competency at more than a minimal level is expected of a candidate for a Ph.D. in Biophysics:

1. Biology—competency to include at least one area of biology in which the candidate could be presumed to be capable of doing independent work.
2. Modern physics through the basic ideas of quantum mechanics.
3. Physical chemistry including thermodynamics.
4. Biochemistry.
5. Mathematics through elementary differential equations.

## AREAS OF STUDY AND COURSES

This background would normally be acquired by taking a sufficient number of courses from the following list:

Biochemistry 100a, 101, 200a, 206b

Biology 30a (Principles of Genetics), 101b, 104a, 141b

Chemistry 140a, 145b, 147a

Mathematics 25b (Elementary Differential Equations)

Physics 32a (Mathematical Physics I), 41a and 41b (Modern Physics I and II), 120

A student should have completed this program not later than the end of his second year in residence so that he may be able to take a qualifying examination covering this material. Upon passing this examination, the student will select a thesis supervisor and formally initiate research and course study in the research area of his supervisor. An additional twelve credits are to be taken from among the courses listed above or from other graduate courses and seminars as approved by the student's Advisory Committee. This Committee will be appointed by the thesis supervisor, subject to the approval of the Biophysics Committee. When the student and the thesis supervisor have agreed on the research project, a brief description of the project must be filed with each of the members of the Advisory Committee.

After completing the research and the thesis, the candidate will present and discuss the results and significance of his work during an examination in defense of his thesis.

A reading knowledge of German and French is required. Russian may be substituted for one of these languages if the Advisory Committee determines that it is useful for a student in his particular field of research.

## Chemistry

### OBJECTIVES

The graduate program in Chemistry is designed to lead to a broad understanding of this subject. All students will be required to demonstrate knowledge in advanced modern areas of inorganic, organic and physical chemistry. They will be required also to demonstrate proficiency in selected experimental techniques which are used in chemical research. Advanced courses are offered, satisfactory completion of which will constitute partial fulfillment of these requirements. Research upon which these may be based is restricted at present to the fields of organic and physical chemistry. In these fields, members of the Chemistry staff are currently investigating mechanisms of organic reactions, chemistry of free radicals, asymmetric synthesis, chemistry of organo-phosphorous compounds, chemical-biological problems, chemical kinetics of elementary reactions, statistical theory of atomic and molecular structure, properties of non-aqueous solutions.

To avoid excessive specialization, related advanced work in mathematics, physics and biology may be offered to fulfill degree requirements.

All aspects of the individual programs must be approved.

### ADMISSION

The general requirements for admission to the Graduate School, given in an earlier section of this catalog, apply to candidates for admission to this area of study. In addition, the undergraduate curriculum of applicants should include courses in physics and mathematics (differential and integral calculus), and courses in general, analytical, organic and physical chemistry.

Admission to advanced courses will be based upon results of a qualifying examination in each of these areas of chemistry, which will be taken upon entrance. These examinations will determine whether the student will be required to make up deficiencies in preparation. The qualifying examinations will be given twice a year; (1) during the two-week period ending with the first week of the Fall semester and (2) during the third week in February. The results of the qualifying examinations will be considered during assignment of awards for the subsequent years of graduate study.

### FACULTY

Professor SAUL G. COHEN, *Chairman*: Free-radical reactions. Asymmetric syntheses and enzymatic processes.

\*Professor SIDNEY GOLDEN: Chemical kinetics of elementary reactions. Statistical theory of atomic and molecular structure.

Professor HENRY LINSCHITZ: Reactions of excited molecules. Luminescence. Mechanism of photosynthesis.

Associate Professor ORRIE M. FRIEDMAN: Chemistry of organo-phosphorus compounds. Chemotherapy of cancer.

Assistant Professor PAUL B. DORAIN: Solid state chemistry and electron paramagnetic resonance.

Assistant Professor MYRON ROSENBLUM: Non-benzenoid aromatics and thermally induced rearrangements.

Assistant Professor ISAIAH SHAVITT: Theoretical physical chemistry; application of modern computing techniques to problems of molecular structure.

\*On Leave, 1959-60.



## AREAS OF STUDY AND COURSES

Assistant Professor ROBERT STEVENSON: Chemistry of natural products, particularly steroids and terpenes.

Assistant Professor CHI-HUA WANG: Mechanisms of free radical reactions.

### DEGREE REQUIREMENTS

#### MASTER OF ARTS

*Admission to Candidacy*—The qualifying examinations must be passed with a satisfactory grade by the end of the first year of graduate study.

*Program of Study*—Each candidate for the Master's degree is required to complete satisfactorily:

1. Not less than *eighteen semester hours of lecture course work* in chemistry. Courses in inorganic, organic and physical chemistry shall be included in each program. Graduate courses in related fields may be offered to fulfill the chemistry course requirements on petition to the Department. The petition must be approved prior to registration for such course.

2. *Six semester hours of advanced laboratory work*. This requirement may be met by graduate credit in laboratory work in courses numbered above 100.

*Language*—A reading knowledge of German and an elementary knowledge of French or Russian are required.

*Residence*—The minimum residence requirement for this degree is one year. While generally this will be fulfilled in two semesters and one summer, it may in certain instances be met in two semesters.

#### DOCTOR OF PHILOSOPHY

*Admission to Candidacy*—The qualifying examinations must be passed with a grade of A or B by the end of the first year of graduate study.

*Program of Study*—Each candidate for the Doctor's degree is required to complete satisfactorily:

1. The program of study described for the degree of Master of Arts in Chemistry, or its equivalent.

2. Not less than nine additional semester hours of lecture course work in Chemistry selected from those in the 200 series.

3. A thesis summarizing the results of an original investigation which demonstrates the competence of the candidate in independent investigation, critical ability and effectiveness of expression. The topic of the thesis must receive approval of the Department.

4. A comprehensive written final examination in the major area of research.

5. An oral defense of the thesis.

*Language*—A reading knowledge of German and either French or Russian is required.

*Residence*—The minimum residence requirement for this degree is two years. Ordinarily, three years of full-time study will be necessary for the completion of the course work and the preparation of an acceptable thesis.



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## *Courses of Instruction*

### **CHEMISTRY 121a. Advanced Inorganic Chemistry**

Atomic structure, theory of valence, coordination complexes and inorganic stereochemistry.

Three classroom hours a week.

*Mr. Dorain*

### **CHEMISTRY 130a. Qualitative Organic Analysis**

Experience in the systematic analysis of functional groups and the elucidation of structure of organic chemical substances by various techniques that include the use of spectrophotometric analysis.

One lecture and two three-hour laboratory periods per week.

Laboratory fee: \$10.

*Mr. Wang*

### **CHEMISTRY 131a. Advanced Organic Chemistry**

Stereochemistry, electronic theory, molecular rearrangements, mechanisms of organic reactions.

Three classroom hours a week.

*Mr. Cohen*

### **CHEMISTRY 131b. Advanced Organic Chemistry**

Continuation of Chemistry 131a.

*Prerequisite:* Satisfactory grade in Chemistry 131a.

Three classroom hours a week.

*Mr. Cohen*

### **CHEMISTRY 140a. Chemical Thermodynamics**

Fundamental principles of thermodynamics and application to chemical problems.

*Mr. Shavitt*

### **CHEMISTRY 142b. Physical Chemistry Laboratory**

One lecture, four laboratory hours each week. *2 credits.*

Laboratory fee: \$10.

*Mr. Shavitt*

### **\*CHEMISTRY 143b. Statistical Thermodynamics**

Elementary statistical mechanics of systems in equilibrium; Boltzmann, Fermi-Dirac and Bose-Einstein statistics; microcanonical, canonical and grand canonical ensembles; applications to thermodynamic systems.

Three classroom hours a week.

### **CHEMISTRY 145b. Chemical Kinetics**

Kinetics of homogeneous and heterogeneous chemical change.

Three classroom hours a week.

### **\*CHEMISTRY 147a. Elementary Quantum Mechanics**

Wave properties, matter waves, Schroedinger's equation; operators and observables, wave-functions and eigenvalue problems; stationary states of simple systems, energy spectrum and dispersion relations; potential barriers; perturbation theory.

### **\*CHEMISTRY 231b. Selected Topics in Organic Chemistry**

A seminar course.

*Prerequisite:* Satisfactory grades in Chemistry 131a and 131b or the equivalent.

\* Not to be given in 1959-60.

## AREAS OF STUDY AND COURSES

### **CHEMISTRY 234b. Advanced Organic Chemistry**

Methods of organic synthesis.

*Prerequisite:* Satisfactory grades in Chemistry 131a and 131b or the equivalent.

*Mr. Friedman*

### **CHEMISTRY 235a. Selected Topics in the Chemistry of Natural Products**

Synthetic methods of organic chemistry and their application in the chemistry of natural products.

*Prerequisite:* Satisfactory grades in Chemistry 131a and 131b or the equivalent.

*Mr. Stevenson*

### **\*CHEMISTRY 247b. Quantum Mechanics**

Atomic and molecular structure.

*Prerequisite:* Satisfactory grade in Chemistry 147a or the equivalent.

## *Chemistry Colloquium*

Lectures by faculty and graduate students. Required of all graduate students.

*No credit.*

## *Courses in Research*

**CHEMISTRY 400. Organic Chemistry** *Mr. Cohen*

**CHEMISTRY 401. Organic Chemistry** *Mr. Stevenson*

**CHEMISTRY 402. Organic Chemistry** *Mr. Friedman*

**CHEMISTRY 403. Organic Chemistry** *Mr. Rosenblum*

**CHEMISTRY 404. Organic Chemistry** *Mr. Wang*

**CHEMISTRY 405. Physical Chemistry** *Mr. Golden*

**CHEMISTRY 406. Physical Chemistry** *Mr. Linschitz*

**CHEMISTRY 407. Physical and Inorganic Chemistry** *Mr. Dorain*

\* Not to be given in 1959-60.



## English and American Literature

### OBJECTIVES

The graduate program in English and American Literature is designed to offer training in the interpretation and evaluation of literary texts with some attention to the related scholarly disciplines, particularly history and linguistics. It also offers for candidates who have some ability in writing an opportunity to pursue this interest as a normal part of the graduate program.

### ADMISSION

Candidates for admission should have a Bachelor's degree, preferably with a major in English and American literature, and a reading knowledge of French, or German, or Greek and Latin. The general requirements for admission to the Graduate School, as specified in an earlier section of this catalog, apply to candidates for admission to this area of study.

### FACULTY

Associate Professor IRVING HOWE, *Chairman*: American literature. The novel.

\*Professor JAMES V. CUNNINGHAM: Renaissance literature. Creative writing.

Professor OSBORNE EARLE: Old English. Milton.

Professor PHILIP RAHV: American literature. Criticism.

Visiting Associate Professor JOHN CONLEY: Medieval literature. Creative writing.

Associate Professor MILTON HINDUS: American literature.

Assistant Professor ROBERT EVANS: Linguistics. Chaucer. Creative writing.

Assistant Professor DONALD JOHNSON GREENE: Eighteenth century literature.

Assistant Professor IRVING J. MASSEY: Romantic literature. Comparative literature.

Assistant Professor ROBERT OTTO PREYER: Victorian literature.

Assistant Professor MARIE SYRKIN: English classic texts. Modern American literature.

Dr. JOHN BURT WIGHT: Teacher training.

Mr. HARVEY D. GOLDSTEIN: Seventeenth and eighteenth century literature.

### PROGRAM OF STUDY

The program of study in the first year of graduate work leading to the degree of Master of Arts will consist of six half-courses (three a semester), and the required independent reading course in major texts of English and American Literature. The six half-courses will normally include introduction to literary study, at least one seminar a semester, old English or history and structure of the English language, and may include a half-course in advanced writing. Candidates who are deficient in training, however, will in most cases need additional course work to fulfill the requirements for the degree of Master of Arts.

The program of study in the second year of graduate work leading to the degree of Doctor of Philosophy will consist of six half-courses. These will normally include three or four seminars, the English Seminar, and may include a half-course in advanced writing. The program in the third year of doctoral study will normally be devoted to preparation for the examination on two special fields and for the

\* On Leave, 1959-60.



## AREAS OF STUDY AND COURSES

dissertation examination. Candidates who are deficient in training, however, may require more formal course work.

### DEGREE REQUIREMENTS

#### MASTER OF ARTS

A candidate for the Master's degree:

1. Must have a reading knowledge of French, or German, or of Greek and Latin.
2. Must complete with satisfactory grades at least six approved half-courses, including English 201a and 121 or 192b.
3. Must submit two Master's papers of acceptable quality in two seminars.
4. Must pass the examination in English 299.

*Residence*—The minimum residence requirement is one year, though students with inadequate preparation may require more.

#### DOCTOR OF PHILOSOPHY

A candidate for the Doctor's degree:

1. Must be formally admitted to candidacy for the degree by the Graduate School of Arts and Sciences.
2. Must have a reading knowledge of two of the following languages: Greek, Latin, French, Italian, German.
3. Must complete the requirements for the degree of Master of Arts in English.
4. Must pass the examinations for the Master's degree at a high level.
5. Must complete with satisfactory grades at least six approved half-courses beyond the requirements for the Master's degree; three or four of these must be seminars, and one must be 301b, the English Seminar.
6. Must pass examinations in four fields of English and American literature. Normally one of these fields will be closely related to the topic of his thesis; one may be a major text, for example, *Paradise Lost*; and the other two will be on fields in which his formal training has been deficient. The examinations will be based on reading lists submitted by the candidate and approved by his Committee; the lists should represent the minimum preparation for teaching an undergraduate course on the subject. These examinations may be taken at one time, or in groups of two at two separate times.
7. When the candidate has chosen and explored a topic for his thesis he must petition the Department for a formal conference. This is the dissertation examination; in it the proposed topic, the proposed methods, and the candidate's preparation and his ability to deal with the topic will be discussed. The decisions and stipulations of the Department will be recorded and put on file.
8. Finally, the candidate must submit an acceptable monograph or some comparable contribution to learning, on a topic and in a form approved by the Committee at his dissertation examination.

*Residence*—The minimum residence requirement is one year beyond the Master's degree or two years beyond the Bachelor's, but candidates will normally take three or four years.

## *Courses of Instruction*

In addition to the following courses, graduate students in English and American Literature, with the permission of the Chairman of the Department, may take for credit any Humanities and Comparative Literature courses in the 100 series. For description of such courses refer to the undergraduate catalog.

### **ENGLISH 100a or b. Comprehensive Examination**

An examination required for concentrators in English on the ability to interpret and evaluate literary works, given in December and April. *Staff*

**ENGLISH 105a. Seminar in Dryden, Pope, and Swift** *Mr. Goldstein*

**ENGLISH 106a. Seminar in Johnson, Boswell, and Goldsmith** *Mr. Greene*

**ENGLISH 107b. Seminar in Victorian Literature** *Mr. Preyer*

### **ENGLISH 121. Old English**

An introduction to Old English grammar, with special attention to the rapid attainment of skill in reading. Texts of prose and the shorter poems will be read in the first semester; *Beowulf* in the second semester. *Mr. Earle*

### **\*ENGLISH 142a. Marlowe, Jonson, and Webster**

A close study of the principal dramatic works of Marlowe, Jonson, and Webster, with some selective examination of the development of the drama from the Mystery and Morality plays to the closing of the theatres.

### **ENGLISH 147b. Milton**

This course will consist of an intensive study of Milton, designed to provide a thorough knowledge of his character, thought and art. The reading will include *Comus* and the minor poems, *Paradise Lost*, *Paradise Regained*, *Samson Agonistes*, as well as selections from the prose writings. *Mr. Earle*

### **ENGLISH 155a. Restoration Comedy**

A study of classic English comedy, chiefly of the Restoration dramatists—Etherege, Wycherley, Dryden, Congreve, Vanbrugh. The course will open with the great Restoration ancestor, Ben Jonson, and continue into the eighteenth century to Goldsmith and Sheridan.

*Term paper required.*

Two classroom hours per week.

*Mr. Kronenberger*

### **\*ENGLISH 158a. English Historians**

Readings and discussions in Gibbon, Macaulay, Toynbee, and one or two others.

### **ENGLISH 160a. Whitman and Dickinson**

A study of the work of two American poets of the nineteenth century. Their poetic styles will be compared to each other, to those of their contemporaries, and to those of their successors in the twentieth century: Carl Sandburg, Hart Crane, and Elinor Wylie. *Mr. Hindus*

### **ENGLISH 160b. Studies in American Literature**

The course will deal with a number of the more influential American men of letters—poets and critics—of the twentieth century: T. S. Eliot, Robert Frost, and Irving Babbitt among others. *Mr. Hindus*

\* Not to be given in 1959-60.

## AREAS OF STUDY AND COURSES

### ENGLISH 176b. Modern Comedy

A consideration of comedy, in the wide sense, since its rebirth in the late nineteenth century. There will be particular emphasis on Shaw and Chekhov, and treatment of such playwrights as Wilde, Synge, O'Casey, Pirandello, Molnar, Maugham, George Kelly, S. N. Behrman, T. S. Eliot and Christopher Fry.

*Term paper required.*

Two classroom hours per week.

*Mr. Kronenberger*

### ENGLISH 178a. Shaw and His Contemporaries

A study of English and Continental playwrights of the late nineteenth and early twentieth centuries with a particular emphasis upon the philosophy and writing of Bernard Shaw.

*Mr. Pettet*

### ENGLISH 182b. From James to Faulkner

Selected studies in the twentieth century American novel, with equal emphasis on the idea-patterns and elements of style and form entering into its development. Intensive analysis of single works by the later Henry James, Edith Wharton, Willa Cather, Dreiser, Anderson, Fitzgerald, Dos Passos, Hemingway, and Faulkner, with reference to other novels by the same authors.

*Mr. Rahv*

### \*ENGLISH 184a. The Classic American Historians

Lectures and discussion on the principal American historians and their writings, chiefly in American history. Readings in Irving, Prescott, Motley, Parkman, H. C. Lea, Mahan, Henry Adams, Turner, Beard, and others.

### ENGLISH 188a. History of the American Drama

A study of the American theatre from its beginnings to the First World War.

*Mr. Matthews*

### ENGLISH 188b. History of the American Drama

A study of the American theatre from the First World War to the present.

*Mr. Matthews*

### ENGLISH 192b. History and Structure of the English Language

A study of the linguistic structure of modern English and of the historical processes through which it developed.

*Required of graduate students in the first year.*

*Mr. Evans*

### ENGLISH 201a. Introduction to Literary Study: Shakespeare

*Required of all graduate students in the first year.*

*Mr. Conley*

### ENGLISH 212b. Seminar in Fiction

The topic this year will be the novels of Hardy and Lawrence. Master's paper.

*Mr. Rahv*

### ENGLISH 215a. Seminar in the Middle Ages

The topic this year will be Chaucer's *Troilus and Cresseida*. Master's paper.

*Mr. Evans*

\* Not to be given in 1959-60.

**ENGLISH 216b. Seminar in the Renaissance**

*Mr. Conley*

**ENGLISH 217a. Seminar in the Eighteenth Century**

The topic this year will be Dr. Johnson. Master's paper.

*Mr. Greene*

**ENGLISH 218a and b. Seminar in the Nineteenth Century**

The topic for the Fall semester will be Wordsworth and Coleridge. The topic for the Spring semester will be announced. Master's paper.

Fall Semester: *Mr. Massey*

Spring Semester: *Mr. Preyer*

**ENGLISH 219a. Seminar in American Literature**

*Mr. Howe*

**ENGLISH 299. Major Texts of English and American Literature**

Independent reading of a number of major texts, distributed over the various kinds and periods of English and American literature, with an oral and written examination at the end of the year. This examination, which will consist solely in the interpretation and evaluation of the texts on the reading list, will constitute the examination for the Master's degree, and will serve also as a qualifying examination for the doctorate.

Students preparing for this examination will meet every other week for informal discussion of the texts under the guidance of a member of the faculty. *Staff*

**ENGLISH 301b. The English Seminar**

Each member of the seminar will present a public lecture embodying the results of independent investigation.

*Required of all graduate students in the second year.*

*Mr. Greene*

**ENGLISH 311. Seminar in Teaching**

*Required of all graduate students who are engaged in classroom instruction. No credit.*

*Mr. Wight*

**ENGLISH 400. Research**

Candidates for the Doctor's degree who are in residence and who have completed the formal requirements for admission to candidacy, will register under this number. *Staff*

**ENGLISH COMPOSITION 101a and b. Directed Writing**

Exercises principally in the sketch and the short story.

*Limited enrollment. One two-hour meeting a week.* Fall Term: *Mr. Conley*

Spring Term: *Mr. Evans*

**ENGLISH COMPOSITION 102b. The Writing of Poetry**

*Prerequisite:* Consent of the instructor.

*Mr. Conley*

**\*ENGLISH COMPOSITION 201a. Advanced Exposition**

A conference course designed to assist graduate students in all areas in the preparation of reports and theses.

\*Not to be given in 1959-60.



## History of Ideas

### OBJECTIVES

The graduate program in the History of Ideas leading to the degree of Master of Arts in History is designed to offer broad comprehensive training in the history of philosophy, the history of social and political theory, and the history of religion. The program aims to lay the foundation for instruction in general education courses and for specialized work in the History of Ideas.

Under the same program, the degree of Doctor of Philosophy aims to prepare scholars and teachers in the advanced study of the History of Ideas.

### ADMISSION

An undergraduate major in History, Philosophy, Politics or Sociology is desirable but not a requirement for admission. In addition, the general requirements for admission to the Graduate School as specified in an earlier section of this catalog apply.

### FACULTY

Committee: Professor EDGAR N. JOHNSON, *Chairman*; Professors DAVID S. BERKOWITZ, NAHUM N. GLATZER, FRANK E. MANUEL, HERBERT MARCUSE, JOHN P. ROCHE; Associate Professors LEWIS A. COSER, GEORGE FISCHER.

### DEGREE REQUIREMENTS

#### MASTER OF ARTS

*Program of Study*—The program comprises work in the following four periods of Western civilization:

Ancient	Early Modern
Medieval	Modern

In submitting his program, the candidate must offer a reasonable distribution of work over the fields of Philosophy, Social and Political Thought, and Religion.

A candidate for the Master of Arts degree must complete one year of residence. "Residence" is computed on the basis of four acceptable, six-credit courses or the equivalent. The following are excluded from the computation of acceptable courses for the purpose of meeting residence requirements:

- a) All undergraduate courses.
- b) All language courses.
- c) More than two courses per term from the courses numbered in the 100 series.

At least two of the acceptable courses per term must involve the preparation of seminar papers or written reports.

*Language Requirements*—A candidate must demonstrate a reading knowledge of French or German in an examination offered no later than at the end of the first term.

*Qualifying Examination*—Candidates for the M.A. must qualify in three of the four historical periods in an examination administered by the Committee in the History of Ideas. Qualification in the fourth period may be obtained on the basis

of a course grade of B or better in acceptable courses in this period offered at Brandeis University.

The candidate will submit topics in each of the three periods selected for examination. The topics in each period are to be presented in two parts: (a) general topic; (b) a special topic within the general topic. For example: General Topic: History of English Political Theory in the Sixteenth and Seventeenth Centuries. Special Topic: Puritan Theories of Law.

### DOCTOR OF PHILOSOPHY

A candidate for the Ph.D. degree must complete two years of residence or forty-eight course credits. Candidates who have not obtained their Master of Arts at Brandeis University may be required to take a qualifying examination before being admitted to work for the Ph.D. unless exempted by the Committee. The scope of this examination is identical with the qualifying examination for the M.A. degree.

*Language Requirements*—A candidate must demonstrate a reading knowledge of French and German in examinations prior to the approval of his dissertation topic.

*Dissertation and Examination*—The candidate must obtain approval of his dissertation topic from his supervisor and from the Chairman of the Committee in the History of Ideas. After the approval of the dissertation topic but not less than two semesters after the completion of the Master's requirements or their equivalent, the candidate must demonstrate his competence in an oral examination on his major field of concentration.

The dissertation must be approved by a Committee of readers appointed by the Chairman of the Committee in the History of Ideas. After such approval the candidate must pass a final oral examination in defense of the dissertation.

### *Courses of Instruction*

\***HISTORY OF IDEAS 116a. The Book of Job and the Problem of Evil**

**HISTORY OF IDEAS 121. History of Social and Political Ideas in Antiquity and the Middle Ages.**

An advanced course presenting intensive textual analyses of the major political documents of Plato, Aristotle and the Stoics, Christian conception of society, church authority and the church-state relations in the Roman Empire. Medieval patterns of reconstruction and conflict from Augustine to the rise of the dynasty state.

*Mr. Berkowitz*

\***HISTORY OF IDEAS 128b. Reformation and Counter-Reformation**

History of the movement for church reform from the medieval period through the sixteenth century.

\***HISTORY OF IDEAS 132b. Philosophies of History from Vico through the Present**

A study of central themes in European philosophy of history in modern times. Lectures and the reading of selected texts.

**HISTORY OF IDEAS 144a. Introduction to Medieval Philosophy**

This course is designed to offer an introduction to the medieval tradition in Islamic, Jewish, and Christian philosophy. It is concerned with the fundamental

\* Not to be given in 1959-60.

concepts of Aristotelian physics, metaphysics, and psychology and their neo-platonic development as reflected in the medieval schools of thought.

*Prerequisite:* Permission of the instructor.

*Mr. Altmann*

**HISTORY OF IDEAS 144b. Faith and Reason in Medieval Philosophy**

An analysis of the various attempts made in medieval Islam, Judaism, and Latin Christianity to relate philosophy to religious truth. A number of important texts will be read in English translation.

*Prerequisite:* Permission of the instructor.

*Mr. Altmann*

**HISTORY OF IDEAS 145a. Philosophy of Science**

This course is designed as an introduction to fundamental philosophical problems of the physical sciences. It will deal with problems of explanation, confirmation, and use of general laws in the physical sciences.

*Prerequisite:* Permission of the instructor.

*Mr. Frank*

**HISTORY OF IDEAS 158a. From Hegel to Nietzsche**

Problems in the development of philosophy from the nineteenth to the twentieth centuries.

*Mr. Marcuse*

**HISTORY OF IDEAS 160b. The Metaphysics of Hume**

Critical study of Hume's leading metaphysical ideas and their place in the empiricist traditions.

*Prerequisite:* Permission of the instructor.

*Mr. Passmore*

**\*HISTORY OF IDEAS 205b. Political Ideas of Plato, Aristotle and St. Augustine**

Intensive analysis of major texts dealing with basic conceptions of political and social philosophy and related developments in ideas and institutions.

**\*HISTORY OF IDEAS 208a. Studies in Eschatological Theories**

For description see NEJS 258a.

**\*HISTORY OF IDEAS 217a. The Thought of the Latin Fathers of the Church**

Readings, discussions and seminar reports and papers on the thought and careers of Saints Jerome, Ambrose, Augustine and Gregory the Great.

**\*HISTORY OF IDEAS 218a. Intellectual History of the Twelfth and Thirteenth Centuries**

Readings, reports, and seminar papers on selected topics related to the various aspects of the medieval revival.

**HISTORY OF IDEAS 226a. Problems in Sixteenth Century Political Theory**

Research Seminar.

*Mr. Berkowitz*

**\*HISTORY OF IDEAS 228a. Seventeenth Century Rationalism**

Study of the formation of philosophical rationalism in connection with the rise of modern science; Galileo, Descartes, Malebranche. The main topic of the course will be the philosophical interpretation and justification of modern science.

\* Not to be given in 1959-60.

**HISTORY OF IDEAS 229b. Problems in the Intellectual History of England in the Seventeenth Century**

Graduate seminar requiring a finished scholarly report. Topics may be selected dealing with political theory, constitutional thought, and certain aspects of theology and philosophy.

*Mr. Berkowitz*

**HISTORY OF IDEAS 232. The Age of Enlightenment**

Selected problems. A reading knowledge of either French or German is required.

*Mr. Manuel*

**HISTORY OF IDEAS 241. French Political Thought in the Nineteenth Century**

A systematic discussion of the main political theories in nineteenth century France. Counter-revolutionary thought; trends in French liberalism; the main French Socialist thinkers.

*Mr. Coser*

**HISTORY OF IDEAS 243a. The Intellectual Antecedents of the Russian Revolution**

Russian social thought in the century before 1917.

*Mr. Fischer*

**HISTORY OF IDEAS 300. Readings in History of Ideas**

*Staff*

**HISTORY OF IDEAS 400. Doctoral Research**

*Staff*

**HISTORY 101a. Intellectual History of Greece**

The course will be conducted by lectures and by discussions of selected texts. Topics such as the following will be considered: The nature of Greek mythology. The rise of rational thought among the Pre-Socratic philosophers. Periclean drama and historiography. The rivalry of philosophy and rhetoric in the fourth century. The schools of philosophy in the Hellenistic Age.

*Mr. Reiche*

**\*HISTORY 123b. The Transition from the Late Roman to the Early Medieval World**

A study of the decline of ancient civilization. Reading and discussion of pertinent documents together with lectures, reports and papers on dominant figures and ideas. The emphasis will be on the Western Empire.

**HISTORY 129a. The Renaissance and Reformation in Sixteenth Century England**

The development of institutions and outlooks in sixteenth century England under the impact of Renaissance and Reformation currents.

*Mr. Berkowitz*

**HISTORY 130b. Topics in the Constitutional History of Seventeenth Century England**

The intellectual and institutional background of the constitutional crisis and the development of related political theories in seventeenth century England; the nature of law and authority, the Crown in Parliament, the royal prerogative and parliamentary sovereignty, liberties of the subject, religious toleration.

*Mr. Berkowitz*

\* Not to be given in 1959-60.



**HISTORY 131. Main Currents in Modern European Thought**

A study of main currents in European thought since the end of the seventeenth century as revealed in the writings of men who profoundly influenced the ideas and sentiments of the modern world. Emphasis will be placed on the great thinkers who formulated a moral outlook for their age. Lectures and the reading of selected texts.

*Mr. Manuel*

**HISTORY 141a. Intellectual History of Russia**

Russian thought from the nineteenth century to 1917.

*Mr. Fischer*

**HISTORY 163. American Intellectual History**

The history of ideas in America from the seventeenth century to the present. The course traces the evolution of the major traditions through the writings of significant figures and in relationship to significant historical events.

*Mr. Peterson*

## Mathematics

### ADMISSION

The general requirements for admission to the Graduate School, given in an earlier section of this catalog, apply to candidates for admission to this area of study.

### FACULTY

Associate Professor OSCAR GOLDMAN, *Chairman*: Algebra and arithmetic.  
 Associate Professor ARNOLD S. SHAPIRO: Topology and differential geometry.  
 Assistant Professor MAURICE AUSLANDER: Algebra.  
 Assistant Professor EDGAR H. BROWN, JR.: Topology.  
 Assistant Professor WILLIAM LIND HOYT: Algebraic geometry.  
 Assistant Professor JOSEPH J. KOHN: Complex analytic manifolds.  
 Dr. HOWARD STEIN: Lie groups.

### DEGREE REQUIREMENTS

Students completing an approved course of study in Mathematics, and demonstrating an ability for creative research, will be awarded the degree of Doctor of Philosophy. The Master of Arts degree is also offered. Candidates for admission should be well prepared in modern mathematics.

The primary method for demonstrating competence in research is, of course, an original dissertation. In addition, students expecting to receive the Ph.D. degree should complete the residence requirement, consisting of two years of an approved program of study, and the language requirement, consisting of a reading proficiency in two foreign languages. Examinations will be given to determine the student's fitness for candidacy for the degree.

The M.A. degree will be awarded upon completion of a portion of the above requirements, consisting of one year's residence, proficiency in one foreign language, and the passing of a general examination.

Normally a full-time student will take three courses per semester during his first two years of study.

## *Courses of Instruction*

### **MATHEMATICS 101. Algebra**

Groups, rings, fields, etc. Selected topics from ideal theory and the structure theory of rings. *Mr. Hoyt*

### **MATHEMATICS 105. Foundations of Analysis**

Set theory, development of the real numbers from the integers, metric spaces, uniform continuity and convergence. *Mr. Brown*

### **\*MATHEMATICS 121. Complex Analysis**

### **MATHEMATICS 208. Differential Geometry**

Riemannian manifolds, tensor calculus, harmonic integrals, sheaves. Applications to complex manifolds. *Mr. Kohn*

\* Not to be given in 1959-60.

## AREAS OF STUDY AND COURSES

### **\*MATHEMATICS 210. Algebraic Topology**

### **MATHEMATICS 215. Topological Groups**

Elementary theory of topological groups and their representations. *Mr. Shapiro*

### **MATHEMATICS 230. Homological Algebra**

Study of the functors tensor product, hom, tor, ext and other associated homological invariants. Applications to ring theory.

*Prerequisite:* A knowledge of the notion of complex. *Mr. Auslander*

### **MATHEMATICS 250. Algebraic Geometry**

An introduction to the basic notions of abstract algebraic geometry.

*Mr. Goldman*

### **MATHEMATICS 290. Seminar in Algebra**

*Messrs. Auslander,*

*No credit.*

*Goldman, Hoyt*

### **MATHEMATICS 293. Seminar in Analysis**

*Messrs. Kohn and Stein*

*No credit.*

### **MATHEMATICS 296. Seminar in Topology**

*Messrs. Brown and Shapiro*

*No credit.*

### **MATHEMATICS 298. Readings in Mathematics**

*Staff*

### **MATHEMATICS 400. Doctoral Dissertation**

*Staff*

## Mediterranean Studies

### OBJECTIVES

The graduate program in Mediterranean Studies aims at inducting the student into the investigation of major problems involving the meeting of different peoples in and around the Mediterranean Sea, where Western civilization was first created and then developed. The instruction will train the student to master the primary sources as he learns the broad synthesis. Master of Arts as well as Doctor of Philosophy candidates are expected to show a grasp of the problem as a whole, as well as the ability to work in a variety of different sources. Doctor of Philosophy candidates will be required to demonstrate also a capacity for original research.

It is planned to extend the scope of the Department to cover Mediterranean developments throughout Antiquity, the Middle Ages, and Modern Times. During 1959-1960, the Department will deal with the first period during which Asiatic and Greek forces met, laying much of the foundation for Western Culture.

During 1960-1961, the graduate program in Mediterranean Studies will deal with the intermediate period, between Alexander and Mohammed. A comparative study will be made of the teachings of Epictetus, the Coptic Fathers and the Jewish Fathers. Another course will be offered on the magic of the period, taking the Aramaic Incantation Bowls as the point of departure. A course on the general history of the era will be open to both graduate and qualified undergraduate students.

All courses will involve two or more interrelated sources. While it is desirable for the student to know as many of the sources as possible in advance, no student is expected to come ideally equipped with complete linguistic preparation. If a course requires the use of a source that the student has not already studied, he will ordinarily be permitted to enroll, provided that he is concurrently taking a basic language course to make up the deficiency.

While texts are the points of departure in all courses in this Department, class discussion will draw also on archeological materials and revolve about historic problems.

### ADMISSION

The general requirements for admission to the Graduate School, given in an earlier section of this catalog, apply to candidates for admission to this area.

Students planning to enter this Department should take as much Hebrew, Greek and Latin as possible during their undergraduate course of study.

### FACULTY

Professor CYRUS H. GORDON, *Chairman*: Cuneiform, Egypto-Semitic, and East Mediterranean studies.

Assistant Professor THALIA HOWE: Greek language, literature, and archeology.

Assistant Professor GERARD G. SALINGER: Arabic, Persian, and Turkish studies.

Assistant Professor DWIGHT WAYNE YOUNG: Egypto-Semitic and Cuneiform studies.



## AREAS OF STUDY AND COURSES

### DEGREE REQUIREMENTS

#### MASTER OF ARTS

*Program of Study*—Each candidate for the Master's degree is required to complete satisfactorily:

1. Not less than twenty-four semester hours of course work in the Department, plus any courses outside the Department that the major professor may prescribe.

2. The candidate must show a command of either Latin or Greek, and of Hebrew plus at least one other Oriental language (such as Akkadian, Ugaritic, or Egyptian).

3. The student must demonstrate, in written and oral examinations, proficiency in the sources of two major areas of the program and an ability to synthesize them. A broad grasp of the Mediterranean origins of Western Civilization will also be required of all candidates, beyond the specific topics covered in courses.

*Language*—A reading knowledge of one modern foreign language (ordinarily French or German) is required.

#### DOCTOR OF PHILOSOPHY

The requirements are the same as for the Master of Arts degree, plus twenty-four additional semester hours of course work in the Department, a reading knowledge of two modern foreign languages (ordinarily French and German), and a doctoral dissertation.

*Admission to Candidacy*—A student shall be eligible for admission to candidacy upon completing his language requirements and satisfactorily passing his written and oral examinations. Proficiency in those examinations must be demonstrated in three major areas of the program; *e.g.*, Assyrian, Greek, and Hebrew (texts and history), or Egyptian, Ugaritic, and Arabic.

*Dissertation and Defense*—The dissertation should be a significant and original contribution to scholarship and should demonstrate a capacity for independent research based on primary sources. After submission of the dissertation, the candidate will be expected to defend it in a final oral examination.

#### *Courses of Instruction*

##### **\*MEDITERRANEAN STUDIES 105. Elementary Akkadian**

For description see NEJS 105.

##### **MEDITERRANEAN STUDIES 106. Egyptian**

For description see NEJS 106.

*Mr. Young*

##### **\*MEDITERRANEAN STUDIES 108. Elementary Ugaritic**

For description see NEJS 108.

##### **MEDITERRANEAN STUDIES 109. Akkadian Documents from the Amarna Age**

For description see NEJS 109.

*Mr. Young*

##### **\*MEDITERRANEAN STUDIES 112. The Achaemenian Age**

Herodotus' account of the Persians (including the invasions of the West by Darius I and Xerxes I) will be studied together with the Biblical Books of the

\* Not to be given in 1959-60.

## AREAS OF STUDY AND COURSES

Persian Period (especially Ezra, Nehemiah and Esther). Use will also be made of the Old Persian, Babylonian and Aramaic inscriptions of the Period.

### **\*MEDITERRANEAN STUDIES 201. The Cuneiform Records of Anatolia and Adjacent Areas**

Hittite, Ugaritic and selected Akkadian tablets will be read with a view to investigating the transmission and development of culture around the East Mediterranean during the Amarna and Mycenaean Periods. The purpose of the course is to delineate the backdrop of classical Hebrew and Greek civilizations.

### **MEDITERRANEAN STUDIES 202. The Amarna Age Synthesis**

The class will read a variety of ancient texts that will serve as a springboard for delineating the origins of western culture. The emphasis will be on Ugaritic poems that bridge specific segments of early Hebrew and Greek literatures. *Mr. Gordon*

### **MEDITERRANEAN STUDIES 400. Research in Mediterranean Studies**

Individual guidance for doctoral candidates engaged in thesis research.

*Mr. Gordon*

\* Not to be given in 1959-60.

## AREAS OF STUDY AND COURSES

### Music

#### OBJECTIVES

The graduate program in Music, leading to the degrees of Master of Fine Arts and Doctor of Philosophy, is designed to assist in promoting creative endeavor and the acquisition of deeper insight into the nature and esthetic basis of music and the historical development of musical styles and techniques.

Two general fields of study are offered in Music:

1. *Musical Composition*—This program leads to the degree of Master of Fine Arts, which is regarded as terminal for composers, who at this point should be able to embark upon a professional career.

2. *Music History, Analysis and Criticism*—This program leads to the degrees of Master of Fine Arts and Doctor of Philosophy. Students may specialize in one of these three categories, but are expected to acquire a background in all three.

#### ADMISSION

Only a limited number of students will be accepted. The general requirements for admission to the Graduate School, as specified in an earlier section of this catalog, apply to candidates for admission to this area of study.

Applicants for study in Musical Composition will be required to submit, in addition to a transcript of their undergraduate records, evidence of qualification in the form of examples of advanced work in musical theory and original work in musical composition. This work should be submitted together with the formal *Application for Admission*.

Candidates for admission to the Composition program are expected to be proficient at the piano or on some orchestral instrument possessing a standard solo repertory. Such students should furnish information about this when making formal application.

Admission is granted for one academic year at a time. Students in residence must make formal application between March 1 and March 15 to the Department for readmission. Readmission will be refused in cases where students have not demonstrated a capacity for acceptable graduate work.

#### FACULTY

Associate Professor KENNETH LEVY, *Chairman*: Professors ARTHUR BERGER, IRVING G. FINE; Associate Professor HAROLD SHAPERO; Assistant Professor CALDWELL TITCOMB; Mr. MARTIN BOYKAN, Mr. ROBERT L. KOFF.

#### DEGREE REQUIREMENTS

##### *Language—*

Group A: French, German, Italian.

Group B: Spanish, Latin, Hebrew, Greek (and other languages at the discretion of the Music faculty).

A reading knowledge of a language from Group A is normally required of all applicants for admission to a graduate program in Music.

Candidates for the Master's degree specializing in Musical Composition must possess a reading knowledge of two of the above languages, of which at least

one must be from Group A. (The combination of Italian and Spanish will not be approved).

Candidates for the Master's degree specializing in Music History, Analysis and Criticism must possess a reading knowledge of two languages in Group A.

Candidates for the Doctor's degree in Music must possess a reading knowledge of all three languages in Group A. (In exceptional cases, the Music faculty may accept a language in Group B in lieu of Italian).

Foreign language course credits will not in themselves constitute fulfillment of the language requirements for advanced degrees. All candidates must pass language examinations set by the Music faculty and offered periodically during the academic year. Students are urged to take these examinations at the earliest feasible date. In case of failure, an examination may be taken more than once.

The language examinations are designed to test the students' ability to make ready and accurate use of critical and literary works. Normally each examination will contain three passages for written translation into idiomatic English: (1) classical or modern prose; (2) classical or modern poetry, often poetry that has been set to music; and (3) critical prose dealing with music. Dictionaries may be used in these examinations.

*Instrumental Proficiency*—At least moderate proficiency at the piano is required of all candidates for advanced degrees.

### *Residence—*

#### a. For the degree of Master of Fine Arts:

Thirty-six semester hours of work at the graduate level completed with distinction and a thesis are required of all candidates (one course meeting three times a week for two semesters is counted for six hours' credit).

Applicants who have done graduate or advanced work elsewhere may apply for credit for such work. Under any circumstances a minimum residence of one year's work at the graduate level is required.

In general, the program should be completed in two academic years. Students should take no more than four courses in any one year. It is suggested, however, that students pursue no more than three courses during the year in which they take general examinations and submit a thesis. Those students holding teaching assistantships may reduce their load to two courses.

#### b. For the degree of Doctor of Philosophy:

A minimum of forty-eight semester hours of work at the graduate level completed with distinction is required of all candidates.

In general, the program may be completed in three academic years.

Applicants who have done graduate or advanced work elsewhere may apply for credit for such work.

*Examinations*—Early in March of their first year of study, graduate students will be expected to pass an examination in the standard literature of music, from the early eighteenth century to the present. Upon admission, each candidate will receive a list of works to guide his listening.

Candidates for the degree of Master of Fine Arts will be expected to pass with distinction a general examination in musical theory, history, and style at the time of the completion of their program of study.

Candidates for the degree of Doctor of Philosophy will be expected to pass with distinction a special examination after meeting their language and residence requirements. They will also be expected, after completion of their dissertation, to defend it in an oral examination.



## AREAS OF STUDY AND COURSES

*Thesis and Dissertation*—Candidates for the degree of Master of Fine Arts in Musical Composition are required to submit a thesis normally consisting of an original composition in a large form.

Candidates for the degree of Master of Fine Arts in Music History, Analysis and Criticism are required to submit an acceptable written thesis on a topic approved by the Music faculty.

Candidates for the degree of Doctor of Philosophy in Music must submit an acceptable written dissertation on a subject approved by the Music faculty.

Written theses and dissertations should demonstrate the competence of the candidate as an independent investigator, his critical ability, and his effectiveness of expression.

### *Courses of Instruction*

#### **\*MUSIC 100. Studies in the Theory and Practice of Musical Performance**

##### **MUSIC 101c. Collegium Musicum**

String ensemble, wind ensemble, small choral group.

One three-hour evening session devoted to readings and rehearsals of works drawn from the repertory of music for these media. Some works for the combined groups will be prepared for concert presentation. No graduate credit.

*Mr. Koff and Assistants*

##### **MUSIC 102. Historical Analysis of Music to 1750**

Studies in the development of musical idioms and forms and of the relation of music to society. Detailed analysis of representative works, collateral reading, papers on assigned topics.

*Mr. Titcomb*

#### **\*MUSIC 103. Historical Analysis of Music from 1750 to the Present**

##### **MUSIC 115c. Choral Conducting**

Theory and practice of conducting techniques. Consideration of the problems of rehearsal and performance. Exercises in the conducting of a class chorus in music of various periods.

*Prerequisites:* A reasonable facility in musical performance, theoretical background, and permission of the instructor. No graduate credit.

*Mr. Patterson*

##### **MUSIC 138b. Ensemble Workshop**

An approach to the interpretation of music based on an understanding of style and structure. The course is designed to give an insight into the various elements that make up musical performance. Students will be grouped into small chamber ensembles which will be coached individually by faculty members. At the beginning of the course a supplementary list of works not to be covered during the regular sessions will be distributed. Students will be expected to prepare these works independently and pass an examination on them at the end of the semester.

*Mr. Koff and Staff*

##### **MUSIC 152. Advanced Harmony**

Keyboard harmony, harmonic analysis, realization of figured basses, modern harmony.

Two class meetings and two laboratory sessions.

*Mr. Boykan*

\* Not to be given in 1959-60.

**MUSIC 153. Principles of Counterpoint**

Studies in strict, modal, and tonal contrapuntal writing.  
Two class meetings and two laboratory sessions.

*Mr. Fine*

**MUSIC 154. Instrumentation and Orchestration**

The instruments of the orchestra; the development of their construction, acoustics and playing techniques from the Baroque era to the present, with a consideration of their use by major composers; the methods of writing effectively for present-day instruments, individually and in combination; the mechanics of reading and writing a score.

Written exercises, analysis of scores, study of recorded performances, and live demonstrations.

*Mr. Shapiro*

**\*MUSIC 155. Advanced Keyboard Harmony and Thorough Bass**

**MUSIC 157. Composition in the Homophonic Forms**

The melodic phrase; types of accompaniment; studies in harmonic rhythm; trio forms, rondo forms, sonata forms, variation forms. Analysis and exercises.

*Prerequisites:* Music 152 and 153 or their equivalents.

*Mr. Fine*

**MUSIC 185a. Berlioz**

A study of the great representative of Romanticism and versatile pioneer of modern music; Berlioz the man, composer, conductor, producer, missionary, litterateur, critic, theorist, textbook writer and poet. Main emphasis will be on examination and discussion of selected musical works.

*Prerequisite:* Some advanced training in music history and/or theory. An acquaintance with French is also recommended.

*Mr. Titcomb*

**\*MUSIC 194b. History and Practice of Music Criticism**

An examination of music criticism from the Baroque to the present day, with special attention to important nineteenth and twentieth century critics.

*Prerequisite:* A knowledge of music history and theory.

**MUSIC 199. Colloquium**

Informal monthly meetings of faculty and students for the discussion of musical topics of general interest. Required of graduate students.

*No credit.*

*Staff*

**\*MUSIC 200. Materials of Research**

This course will acquaint the student with the main tools and materials of research, so as to enable him readily to pursue musicological, critical, and analytical projects in music both old and new. Practical application will be made through investigation and discussion of selected topics of importance or special interest.

*Given in alternate years.*

**\*MUSIC 250. Advanced Musical Analysis**

Investigation of methods of analysis of the total musical structure as distinct from conventional formulae. The intrinsic nature of tones will be considered to

\* Not to be given in 1959-60.

determine the relationships to which they lend themselves. The concepts of musical unity of Schenker and other original thinkers in the field of analysis will be examined, applied and evaluated. The role of analysis in criticism.

## **MUSIC 256. Canon and Fugue**

Principles governing the construction of invertible counterpoint, various kinds of canon, strict and free fugues. Analysis of classic and modern canons and fugues and detailed study of Johann Sebastian Bach's "Art of Fugue." Written exercises.

*Mr. Shapero*

## **\*MUSIC 258. Twentieth Century Techniques**

Studies in composition employing musical materials developed in the modern period. Impressionistic harmony, twelve-tone methods, pandiatonism, polytonality, asymmetric rhythm, modern melody and form. Analysis of works by Debussy, Stravinsky, Schoenberg, Milhaud, Hindemith, Copland, and others.

*Given in alternate years.*

## **MUSIC 259. Special Studies in Contemporary Music**

The most representative works of Stravinsky will be analyzed in detail during the first semester and those of Schoenberg and his chief disciples (Berg and Webern) will be similarly treated during the second semester. Emphasis will be placed on apprehension of the essential structure and technique of individual works under consideration.

*Mr. Berger*

## **MUSIC 260. Seminar in Medieval and Renaissance Music**

A comprehensive survey of the history of music from early Christian times through the end of the sixteenth century.

*Mr. Levy*

## **\*MUSIC 271a. Problems in the History of Liturgical Chant in the Middle Ages**

Studies in the musical forms, liturgy, and notation of the chants of the Western Church (Gregorian, Beneventan, Old-Roman, Ambrosian, Gallican, and Mozarabic) and of the Byzantine Church. Consideration will be given to the problem of origins in the Early Church and Synagogue.

## **\*MUSIC 272b. Problems in the History of Sixteenth Century Music**

Historical and style-critical studies of French, Italian, and English music from the late works of Josquin through the early recitative style.

## **MUSIC 274b. Seminar in Baroque Music**

A study of historical problems in music of the seventeenth and early eighteenth century; the relationships of music with the other Baroque arts.

*Mr. Titcomb*

## **\*MUSIC 280. Problems in the Notation of Music in the Middle Ages**

Trouvere notation; modal and mensural notations of the thirteenth century; French and Italian notations of the *Ars Nova*; white notation of the fifteenth century; introduction to Byzantine and Gregorian paleography; readings from the medieval theorists.

*Given in alternate years.*

\* Not to be given in 1959-60.

## AREAS OF STUDY AND COURSES

### **MUSIC 292. Free Composition**

Seminar meetings and private conferences.

*Mr. Berger and Staff*

### **MUSIC 299. Individual Research and Advanced Work**

Individual research and advanced work in musical literature, musical history and in special problems of musical analysis, esthetics, theory and criticism. *Staff*

### **MUSIC 400. Direction of Doctoral Dissertation**

*Required of all doctoral candidates.*

*Staff*



## Near Eastern and Judaic Studies

### OBJECTIVES

The graduate program in Near Eastern and Judaic Studies, leading to the Master of Arts and Doctor of Philosophy degrees, is designed to train scholars and teachers in the various cultures of the Near East and of the classical and modern Judaic civilization, and to do further research in these areas. This work is done mainly through study of the relevant languages and literatures and interpretation of historical sources.

### ADMISSION

The general requirements for admission to the Graduate School, as specified in an earlier section of this catalog, apply to candidates for admission to this Department.

### FACULTY

Professor ALEXANDER ALTMANN, *Chairman*: History of Jewish philosophy and mysticism. Medieval philosophy. Classical Bible commentaries.

\*Professor NAHUM NORBERT GLATZER: Jewish history. Literature of the Second Commonwealth. Hebrew historiography. Eschatology.

Assistant Professor HENRY A. FISCHER: Biblical Apocrypha. Hellenism. Philo. History of religion in late Antiquity. Origins of Christianity.

Assistant Professor GERARD G. SALINGER: Arabic language and literature. Islamic studies. Amharic, Ethiopian (Geez), Persian, Turkish.

Assistant Professor DWIGHT WAYNE YOUNG: History of the Ancient Near East. Akkadian, Egyptian, and Coptic. Old Testament philology. Ugaritic.

Dr. SVI RIN: Semitic philology. Biblical Hebrew and Aramaic. Canaanite inscriptions. Ugaritic.

### PROGRAM OF STUDY

Among the main fields in the area of Near Eastern and Judaic Studies in which courses are being given in the Graduate School are:

Semitic Languages and Literatures (Akkadian, Arabic, Aramaic, Egyptian, Hebrew, Ugaritic).

History of Ancient Near East.

Cuneiform Studies.

Islamic Studies.

Biblical Studies.

Jewish History.

Medieval Jewish Philosophy and Mysticism.

If requested, reading courses in the following languages can be given:

Amharic, Coptic, Ethiopian (Geez), Persian, Turkish.

Fields of study not listed here may be approved.

### DEGREE REQUIREMENTS

#### MASTER OF ARTS

*Residence*—The student is required to complete four full courses in the Department. Programs of study are kept flexible; the Department will consider the

\* On Leave, 1959-60.

needs and interests of each student and advise him in outlining a program of study; this program may be modified later by the Department. Students may be required to take courses given by other Departments. A student who can, on admission, give evidence of satisfactory competence in one Semitic language or in one particular field of Near Eastern and Judaic Studies, will be able to complete the program for his degree in one year. Additional resident study may be required of less advanced students.

*Language Requirements*—Every candidate for the degree of Master of Arts must show proficiency in one Semitic language, and in French or German. In special cases, another modern foreign language may be substituted for one of the two listed here. The foreign language requirement is to be satisfied by examination not later than eight weeks before a candidate is to receive his degree.

*Thesis*—A thesis should be submitted not later than May 1 of the year in which the degree is to be conferred. In certain cases students for the Master of Arts degree may be allowed to substitute one full course of graduate study in lieu of the thesis.

*Examination*—An oral examination is given at the conclusion of the student's residence. The examination is organized around two major subjects chosen from the fields of study undertaken by the student and is designed to test the student's knowledge in those subjects as well as his ability to relate his information to the large area to which those subjects belong. A student who fails to pass the examination, or any part of it, may apply for re-examination, which will take place not earlier than one semester after the date of the first examination.

## DOCTOR OF PHILOSOPHY

*Residence*—The formal course requirement (which varies between five semester courses and four full courses) is established after a conference of the candidate with the Chairman of the Department. However, the main emphasis is placed on the student's individual research.

The residence normally required of a Ph.D. student who is a holder of an M.A. degree is one year; a longer residence will be required for part-time students and students holding teaching assistantships.

A student registered for studies leading to a Ph.D. degree becomes a candidate for the degree when the subject and the synopsis of his dissertation have been accepted by the Department and when he has passed the comprehensive examination (see below).

*Language Requirements*—A candidate for the Doctor of Philosophy degree in this area must show proficiency in two Semitic languages and in two modern foreign languages, as required by his special field of research. The candidate must satisfy his language requirements not later than at the completion of his required residence in the Graduate School.

*Examination*—A written and an oral comprehensive examination in three areas of study (the scope of which being determined at a conference with the examining board) is given at the conclusion of the student's residence. A student who fails to pass the examination, or any part of it, may apply for a re-examination, which will take place not earlier than one semester after the date of the first examination.

*Dissertation*—The student will present a written synopsis and discuss his plans for a dissertation with the professor representing the area, who will assume the supervision of the dissertation. The approval of the supervisor and the Chairman of the Department is required. The conferences on the planning and the progress of

the dissertation take place in the Dissertation Colloquium, a course in which the candidate is to register. Normally, the candidate will continue working on his dissertation after the completion of his residence, i.e., as a nonresident student. The dissertation must demonstrate the candidate's thorough knowledge of the field and his competence in independent research, and must constitute an original contribution to knowledge. Two permanently bound copies of the dissertation, one of which must be the original typescript, are to be deposited in the Office of the Department Chairman not later than April 15 of the year in which the candidate plans to take the degree.

*Final Oral Examination*—A defense of the dissertation.

## *Courses of Instruction*

### **NEJS 101. Basic Arabic**

The course prepares students for classical and modern Arabic literature. Basic grammar of the language. Readings.

Open to those students who have not previously had instruction in Arabic.

*Mr. Salinger*

### **\*NEJS 102. Intermediate Arabic**

Selections from the Qur'an will be studied as a key to Islamic civilization. The linguistic analysis of the text will bring out the relation between Arabic and Hebrew, and lay a foundation for comparative Semitics.

*Prerequisite:* NEJS 101 or its equivalent. Consent of instructor required prior to enrollment.

### **\*NEJS 104b. Biblical Aramaic**

Biblical Aramaic and its relationship to Sam'al Aramaic and to *Reichsaramaisch*. Analysis of Biblical and Egyptian Aramaic texts.

*Prerequisite:* Knowledge of Biblical Hebrew.

### **\*NEJS 105. Akkadian**

Studies in Akkadian grammar. Introduction to the Sumero-Akkadian script. Reading and critical analysis of various types of texts.

### **NEJS 106. Egyptian**

*The Shipwrecked Sailor*, *The Romance of Sinuhe*, and *The Journey of Wenamon* will be read with a view to delineating the Egyptian contribution to East Mediterranean literature. Selected historical and religious texts from the New Kingdom will also be studied. The course will include an investigation of linguistic problems with special reference to Biblical Hebrew.

*Mr. Young*

### **\*NEJS 108. Ugaritic**

An introduction to the Ugaritic language and literature. Reading of Ugaritic epics and myths; analysis of their influence on the poetry and prose of the Bible.

### **NEJS 109. Akkadian Documents from the Amarna Age**

Texts from Nuzu, Ugarit, Alalakh, and Tell el-Amarna will be analyzed. Constant attention will be given to the bearing of the material on biblical problems.

*Mr. Young*

\*Not to be given in 1959-60.

**NEJS 111. Elementary Biblical Hebrew**

Introduction to the basic principles of phonology, morphology, and syntax. Sections from prose and poetry will be read. The course is designed to enable students to read various types of texts fluently. *Mr. Young*

**NEJS 112. Biblical Grammar and Readings**

A systematic introduction to Biblical grammar (including syntax). A selection of pertinent texts will be studied. *Mr. Rin*

**NEJS 115a. The Prophets**

Reading of major portions of the prophetic books; interpretation and analysis with special reference to literary, historical and cultural problems: attention will be devoted to elements of prophetic ideas which have influenced later thought.

*Prerequisite:* Reading knowledge of the biblical text. *Mr. Berman*

**NEJS 115b. The Wisdom Literature: Job, Proverbs, Ecclesiastes**

Interpretation and analysis of the text and selection of classical commentaries.

*Prerequisite:* Reading knowledge of the biblical text. *Mr. Berman*

**\*NEJS 116a. The Book of Job and the Problem of Evil**

A reading of the Book of Job (in English translation) and its parallels in the Ancient Near East literature; a discussion of the role of the Book in the literature and thought of the Western world; an analysis of the problem of evil and of suffering in Judaism and Christianity. (A knowledge of the Hebrew language is not required).

**\*NEJS 117a. The Dead Sea Scrolls**

Reading of the Manual of Discipline and parts of the Zadokite Work and the Habakkuk Commentary in an attempt to understand the origin of the Dead Sea sects, their beliefs and their attitude to the world around them.

*Prerequisite:* Reading knowledge of the Hebrew text.

**\*NEJS 118a. Hellenistic Judaism**

Characteristics of Hellenistic literature, philosophy, and religion. A study of some central concepts of Hellenistic thought and their use and modification in Alexandrian Jewish literature. Hellenistic Judaism and early Christianity.

**NEJS 119a. Introduction to the Apocrypha**

Survey and study of the Apocrypha and Pseudepigrapha, their historical setting and sources, major concepts and ideas; their connections with the sectarian movements, Paganism, and early Christianity. *Mr. Fischel*

**NEJS 121a. The Pentateuch with Classical Commentaries**

Reading of one of the books of the Pentateuch; philological and exegetical analysis based on readings of commentaries of Rashi, Ibn Ezra and Ramban.

*Prerequisite:* Reading knowledge of the biblical text. *Mr. Altmann*

**\*NEJS 123b. Maimonides' Mishneh Torah**

Study of Maimonides' Mishneh Torah as the classical *summa* of Jewish lore and civilization. An introduction to Maimonides as the codifier of Halacha, with

\* Not to be given in 1959-60.



special reference to the social and political ideas of Biblical and post-Biblical Judaism.

*Given in alternate years.*

**\*NEJS 132a. Classical Jewish Thought**

An introduction to the history of the religious and social ideas of Biblical and Talmudic-Midrashic Judaism (central concepts of God and the Universe, Man and History). Post-Talmudic currents of traditional Jewish thought; Jewish mysticism of the Middle Ages; the philosophy of Hasidism and its impact on Jewish thought in modern times.

**\*NEJS 135a. Medieval Jewish Philosophy**

A survey of Jewish thought from the tenth to the end of the fifteenth centuries; Israeli, Saadya, Solomon ibn Gabirol, Bahya ibn Paquda, Judah Halevi, Abraham ibn Daud, Moses ben Maimon, Levi ben Gershon, Hasdai Crescas, Joseph Albo, and some of the philosophic commentators. Analysis of the relation between Hebrew thought and the classical Greek as well as the Islamic and scholastic philosophical trends of the Middle Ages. Readings of selections from various texts of the leading medieval Jewish thinkers.

**NEJS 135b. Introduction to Jewish Mysticism**

A survey of the development of Jewish mystical thought from the early Rabbinic period to the *Zohar*. Reading of selected texts in English translation.

*Mr. Altman*

**NEJS 142a. History of Islam**

History of the Muslim Near East, North Africa, and Spain, from Muhammed to the fall of the Ottoman Empire in 1918. Particular attention will be given to the interplay of domestic and foreign policy. The social and intellectual conditions will be outlined. Selections of texts will be presented in translation. *Mr. Salinger*

**NEJS 142b. Islamic Religion and Institutions**

Basic trends of the religious and social development of the Muslim peoples. Qur'an and tradition. Scholastic theology. Mysticism. The legal systems. State, cities, religions, brotherhoods, guilds. Islam and the modern world. *Mr. Salinger*

**NEJS 145a. History of Islamic Literature to 1200**

Arabic, Persian, Turkish texts will be read in English translation and analyzed against the political, religious, and general cultural background. Inter-Islamic literary influences will be shown as well as those of Islamic and Western literatures. The place of the Islamic literatures in world literature will be evaluated.

*Mr. Salinger*

**NEJS 145b. History of Islamic Literature: 1200 to the Present**

Continuation of NEJS 145a.

*Mr. Salinger*

**\*NEJS 232a. Comparative Semitic Linguistics**

A short history of the Semitic languages. The development of the phonological and morphological systems of the North-West Semitic languages will be discussed, and selected texts will be read.

\* Not to be given in 1959-60.

**\*NEJS 235b. North-West Semitic Inscriptions**

Hebrew, Aramaic, Phoenician and Moabite inscriptions will be read and analyzed. Linguistic and historical problems will be discussed.

**\*NEJS 241b. History of the Hebrew Language**

Survey of the history of Hebrew from earliest extant documents to modern times. Selected texts will be read.

**NEJS 242. Readings in Modern Hebrew Studies in Semitics**

Reading of modern Hebrew and particularly Israeli books and periodicals in the field of Biblical studies and Semitics. The course is designed to acquaint students with the scholarly contributions which appear in the Hebrew language.

*Prerequisite:* A reading knowledge of Hebrew.

*Mr. Rin*

**\*NEJS 251a. Source Studies in Jewish History: Second Commonwealth**

Source studies in the history and culture of Palestine from 538 B.C. to 70 A.D.

**\*NEJS 251b. Source Studies in Jewish History: The Talmudic Period**

Examination of Talmudic-Midrashic material as sources for the political, social and cultural history in the first five centuries.

**NEJS 253b. Philo**

A study of Philo's major historical and philosophical texts, his sources, environment, and influence; a discussion of contemporary views on Philo. *Mr. Fischel*

**\*NEJS 258a. Studies in Eschatological Theories**

An analysis of Messianic and Apocalyptic concepts in the Ancient World and especially in the Old Testament prophets, Apocrypha and the Dead Sea writings. Students doing graduate work in the field of Hebrew literature will read the texts under discussion in the original Hebrew or Aramaic (as far as available).

**\*NEJS 258b. Jewish Messianic Movements**

A study, based on original sources, of the origins and development of the messianic idea and of the messianic movements in Jewish history.

**\*NEJS 259b. Hebrew Historiography**

Reading and critical analysis of selected Jewish historical writings in Late Antiquity and in the Middle Ages. Emphasis will be placed on principles and ideas underlying the historical records. Reference will be made to historical thinking in general, especially in Europe.

**NEJS 310a. Judaica Seminar**

Discussion of important topics in various fields of Judaic studies, tracing the historical development of ideas. Analysis of selected texts and introduction to methods of research. *Mr. Altmann*

**NEJS 400. Dissertation Colloquium**

*Messrs. Altmann and Glatzer*

\* Not to be given in 1959-60.

# Physics

## OBJECTIVES

The graduate program in Physics is designed to equip the student with a broad understanding of all major fields of physics and to train him to carry out independent original research. This objective is to be attained by formal course work and supervised research projects. As the number of students who are accepted is limited, a close contact between students and faculty is maintained, permitting close supervision and guidance of each student.

Advanced degrees will be granted upon evidence by the student of his knowledge, understanding and proficiency in classical and modern physics, and in mathematics. The satisfactory completion of advanced courses will constitute partial fulfillment of these requirements. Research upon which theses may be based, with residence at Brandeis, can be carried out in the following areas:

*Theoretical Physics:* Quantum theory of fields; meson theory; quantum electrodynamics; elementary particle physics; general theory of relativity; nuclear physics; quantum statistical mechanics; thermodynamics of irreversible processes; quantum theory of the solid state; the many-body problem; kinetic theory of ionized gases; plasma physics; theoretical astrophysics.

*Experimental Physics:* Low energy nuclear spectroscopy; high energy experimental physics, primarily work with bubble chambers on the properties of the strange particles.

## ADMISSION

As a rule, only candidates for the Ph.D. degree will be accepted. The general requirements for admission to the Graduate School apply to candidates for admission to the graduate area in Physics. Admission to advanced courses in Physics will be granted following a conference with the student at entrance.

## FACULTY

Associate Professor SILVAN S. SCHWEBER, *Chairman:* Quantum theory of fields. Elementary particle physics. Quantum theory of multiparticle systems.

Associate Professor MAX CHRETIEN: Experimental high energy physics. Elementary particles. Quantum theory of scattering.

\*\*Visiting Associate Professor STANLEY DESER: Quantum theory of fields. Elementary particles. General relativity.

\*Associate Professor DAVID L. FALKOFF: Classical and quantum statistical mechanics. Irreversible processes. Quantum theory of solids.

Associate Professor KENNETH WILLIAM FORD: Properties and structure of nuclei. Beta decay theory. Quantum theory of scattering. Field theory.

Associate Professor EUGENE P. GROSS: Quantum theory of multiparticle systems. Quantum theory of solids. Kinetic theory of ionized gases.

Assistant Professor SAUL BARSHAY: Quantum theory of fields. Elementary particle physics.

Assistant Professor RICHARD J. DRACHMAN: Meson theory. Theory of multiparticle systems.

Assistant Professor VERA K. FISCHER: Experimental low energy nuclear physics. Nuclear spectroscopy. Nuclear scattering.

\* On Leave, 1959-60.

\*\*On Leave, Spring Term, 1959-60.

Assistant Professor JACK S. GOLDSTEIN: Mathematical physics. Astrophysics. Plasma physics.

Assistant Professor KIRK McVOY: Quantum theory of scattering. Low energy nuclear theory. Elementary particles.

## DEGREE REQUIREMENTS

### MASTER OF ARTS

To be recommended for the degree of Master of Arts, a student must pass a qualifying examination at a level considered satisfactory for this degree. This examination will be given twice every academic year during the week preceding the first week of each semester. It will consist of two written examinations covering primarily all the fields of classical physics as well as selected topics in modern physics. In addition, the student must have completed not less than 18 semester hours of advanced course work in physics. With the permission of the Department, a thesis on an approved topic may be presented and may be accepted in place of a course. A reading knowledge of two modern languages, which may be chosen from among Russian, German or French, must be demonstrated before the qualifying examination is taken. The minimum residence requirement for the degree of Master of Arts is one year.

### DOCTOR OF PHILOSOPHY

Requirements for the degree will consist of the following program of study:

Not less than 27 hours of advanced course work in physics, mathematics, or chemical physics must be taken for credit.

To be recommended for candidacy for the Ph.D. degree in Physics, a student must pass a qualifying examination at a level considered satisfactory for this degree. This will consist of three written and one oral examinations, covering the fields of classical and modern physics as well as mathematical physics. Qualifying examinations will be given twice every academic year during the week preceding the first week of each semester. It is expected that every student will have taken these qualifying examinations before the completion of his second year as a full-time student. A reading knowledge of two languages, chosen from Russian, German or French, is required before the qualifying examination can be taken.

The student, after successfully passing the Ph.D. qualifying examination, will choose a thesis adviser and begin writing a dissertation. This dissertation, summarizing the result of an original investigation of an approved subject and demonstrating the competence of the candidate in carrying out independent research, must be approved by the Department. Upon approval, a final oral examination on the dissertation will be scheduled.

A minimum of two years of residence is required for the Ph.D. degree.

### AID TO STUDENTS

A limited number of assistantships, scholarships, and fellowships are available to the most promising candidates. Teaching assistantships are awarded to students in high standing. Research assistantships will be awarded to students of demonstrated ability usually after successfully having passed the Ph.D. qualifying examination. Through auspices of the IBM Corporation, a limited number of assistantships for the training of students in the use of high speed computing machines are



available to students in attendance, upon the recommendation of the Department. The Department, under normal circumstances, will make available summer research assistantships to students in high standing. It is also suggested that the student acquaint himself with the support available from governmental sources such as the National Science Foundation and the Department of Health, Education and Welfare.

## *Courses of Instruction*

### **PHYSICS 101a. Theoretical Mechanics**

Mechanics of point systems, Lagrangian and Hamiltonian methods, small vibrations, transformation theory, integral invariants, kinematics and dynamics of rigid bodies, Hamilton-Jacobi theory, perturbation theory, relativistic mechanics, particle accelerators. *Mr. Deser*

### **PHYSICS 102b. Electromagnetic Theory**

Maxwell's equations. Electrostatics, magnetostatics, boundary value problems. Quasi-stationary phenomena. Radiation. *Mr. McVoy*

### **PHYSICS 110a. Mathematical Physics**

Linear vector spaces, matrices, operators, Hilbert spaces, orthogonal functions, probability theory. *Mr. McVoy*

### **PHYSICS 112b. Methods of Mathematical Physics**

Complex variables, differential equations, boundary value problems, special functions, integral equations, numerical methods. *Mr. Drachman*

### **PHYSICS 120. Quantum Mechanics**

A critical review of the experiments leading to the quantum hypothesis, the quantum mechanics of a "spin," Schrodinger equation, harmonic oscillator, hydrogen atom, perturbation theory, atomic and nuclear scattering, interaction of electrons with radiation field. *Mr. Schweber*

### **\*PHYSICS 130b. Thermodynamics and Kinetic Theory**

Thermodynamics, chemical reactions, irreversible processes, kinetic theory, diffusion, Boltzmann equation. *2 credits.*

Chemistry 140a may be substituted for this course.

### **\*PHYSICS 140a. Theory of Ionized Gases**

Kinetic theory of neutral gases based on the Boltzmann equation. Treatment of relaxation processes, sound waves, boundary value problems. The free molecular flow limit. Kinetic derivation of the equations of hydrodynamics. The self consistent field approximation in plasma physics. Theory of microwave space charge devices. Kinetic foundations of plasma oscillations and magnetohydrodynamics. Topics in discharge physics, controlled fusion processes, astrophysical applications of plasma theory.

### **\*PHYSICS 150a, b. Advanced Laboratory**

Laboratory fee: \$10. *1 credit.*

\* Not to be given in 1959-60.

**\*PHYSICS 204b. Statistical Mechanics**

Ensembles and phase space, Maxwell-Boltzmann distribution, Boltzmann's H-theorem, Einstein-Bose Fermi-Dirac distributions, the quantum mechanical H-theorem, statistical explanation of thermodynamics, applications, theory of condensation, low temperature phenomena.

**PHYSICS 221a. Advanced Quantum Mechanics**

Many body problems. Scattering theory; Dirac equation. Quantisation of scalar, electromagnetic and spinor fields. Feynman graphs. *Mr. Ford*

**PHYSICS 223a. Elementary Particle Physics**

Pair production, Compton effect, Bremsstrahlung, cosmic ray phenomena, high energy meson and nuclear phenomena. *Mr. Chretien*

**\*PHYSICS 240a. Quantum Theory of Solids**

Electronic, vibrational and rotational states of molecules; theory of chemical binding and reactions. Adiabatic approximation. Electronic structure of solids. Band theory. Semi-conductors, metals, impurities, excitons, ferromagnetisms.

**PHYSICS 240b. Quantum Theory of Solids**

Specific heats, lattice, defects, theory of melting, heat conductivity, electron lattice interactions, electrical conductivity. Superconductivity. Collective interactions in solids. *Mr. Gross*

**PHYSICS 251a, b. Laboratory Seminar**

Analysis of some important recent experiments (such as molecular beams, cyclotron, etc.) to understand apparatus and techniques.

*1 credit.*

*Mr. Chretien and Mrs. Fischer*

**\*PHYSICS 260a. Nuclear Physics**

Nuclear forces, theory of nuclear reactions, Beta-decay, liquid drop model, shell model; collective model.

**PHYSICS 270a. Astrophysics**

Hertzsprung-Russell diagram; classification of stellar systems; physics of stellar interiors; radiative transfer problems; abundances of the elements; evolution of stars and stellar systems; structure of cluster, galaxies, etc. *Mr. Goldstein*

**PHYSICS 280b. Topics in Quantum Theory of Fields**

*2 credits.*

*Mr. Barshay*

**\*PHYSICS 301. Seminar in Special and General Relativity**

*3 credits.*

**\*PHYSICS 302. Seminar in Advanced Statistical Mechanics**

*2 credits.*

**PHYSICS 321b. Seminar in Group Theory and Quantum Mechanics**

*2 credits.*

*Mr. Grossman*

\* Not to be given in 1959-60.

*Research Courses*

- PHYSICS 400.** Research in Nuclear Physics *Mr. Ford*
- PHYSICS 401.** Research in Quantum Field Theory *Mr. Schweber*
- PHYSICS 402.** Research in the Quantum Theory of the Solid State *Mr. Gross*
- \*PHYSICS 403.** Research in Statistical Mechanics
- PHYSICS 404.** Experimental Research *Mr. Chretien*
- PHYSICS 405.** Research in Meson Physics *Mr. Schweber*

\* Not to be given in 1959-60.

## Psychology

### OBJECTIVES

The graduate program in Psychology leading to the degree of Doctor of Philosophy is designed for students of promise in the field of general psychology. Theoretical and experimental studies and research projects rather than formal course training will be emphasized. Courses and seminars in special areas, such as clinical psychology, are offered to all graduate students, but no specialized training or special degrees are given. Graduate programs will be arranged individually in consultation with faculty members.

All regular graduate students must pursue programs leading to the Ph.D. Special students, who are not candidates for a degree, may occasionally be admitted; such admissions are for one year at a time. Candidates for the degree of Master of Arts are not admitted, although that degree may be granted when such an action seems in the best interest of the student. In these cases, the degree is based on the successful completion of a year of regular graduate work. A thesis or an examination, or both, may also be required.

### ADMISSION

The general requirements for admission to the Graduate School, as specified in an earlier section of this catalog, apply to candidates for admission to this area of study.

An undergraduate major in Psychology is not required, although it will be favored. Students with inadequate preparation may make up their deficiencies during their first year, but without residence credit. Preference will be given to students who have completed, in addition to basic courses in theoretical and experimental psychology, a broad liberal arts program with some training in the natural and social sciences. Students will be admitted on a competitive basis which will include evaluation of previous academic record and the results of the Graduate Record Examinations (Advanced, Aptitude and Profile Tests), and the Miller Analogies Test.

All regular graduate students are expected to arrive with or to attain proficiency in the following areas:

- History and Systems of Psychology
- Abnormal Psychology
- Elementary Experimental Methods
- Physiological Psychology

Such proficiency will be evaluated by the Chairman at registration or shortly thereafter.

### FACULTY

Professor ABRAHAM H. MASLOW, *Chairman*: Personality theory. Aesthetics. Social interaction.

Professor EUGENIA HANFMANN: Clinical psychology. Personality theory.

Professor HARRY RAND: Clinical practice and training.

Associate Professor RICHARD M. HELD: Experimental and comparative psychology. Theories, systems, and history. Perception and learning.

Associate Professor JAMES B. KLEE: Motivation and emotion. Symbolic and cognitive processes. Human and animal learning.



## AREAS OF STUDY AND COURSES

Associate Professor WALTER TOMAN: Personality and personality theory. Clinical psychology. Child psychology. Psychoanalytic theory.

Assistant Professor RICHARD M. JONES: Educational psychology. Social psychology. Psychotherapy.

Assistant Professor RICARDO B. MORANT: Experimental psychology. Developmental psychology. Perceptual mechanisms.

Assistant Professor ULRIC NEISSER: Experimental psychology. Human and animal learning. Cognitive processes.

## DEGREE REQUIREMENTS

### DOCTOR OF PHILOSOPHY

Four years of full-time graduate study are usually required for the Ph.D.; they must include two years of residence on the Brandeis campus. During these two years, the student will carry fifteen credit units per semester. The ordinary program includes (a) three units in Psychology 300 (Departmental Colloquium); (b) three units in Psychology 200 (Research); (c) Psychology 290-297 (Readings); and (d) three units in each of two other seminars or courses at the 100 level or above. In addition, students may audit any other courses or seminars they desire or need.

*Individual Research*—Each student is expected to engage in collaborative or independent research, with the aim of developing competence in the planning, practice, and evaluation of research. Research work should begin in the first year of residence.

*Teaching*—Each student, whether or not he receives remuneration as a teaching assistant, is expected to do some undergraduate teaching to develop competence in teaching.

*Evaluation of Proficiency*—A. Students are expected to achieve a thorough knowledge of fundamentals in certain areas of psychology during their first three years. Two general areas and seven special areas have been defined by the faculty as follows:

#### a. General Areas:

1. Systematics: History and Theories
2. Statistical Methods

#### b. Special Areas:

##### Group A: Experimental Areas

1. Sensation and Perception
2. Learning and Thinking
3. Physiological and Comparative Psychology

##### Group B: Dynamic Areas

4. Personality and Motivation
5. Psychopathology and Clinical Psychology

##### Group C: Other Areas

6. Genetic and Child Psychology
7. Social Psychology and Anthropology

B. The student's level of proficiency in the two general areas will be determined by written examinations. The examination in Systematics will be read by all members of the faculty; the one in Statistics by a faculty committee.

C. The student will select one area from each of the three groups listed above in which he will be examined by a committee of the faculty. The examinations

may be oral or written, at the option of the student.

D. Some minimal competence is required also in the areas not selected for examination. Determination of minimal competence may be made by any one member of the faculty committee responsible for the area in question. Successful completion of a relevant course or seminar will ordinarily satisfy this requirement, but a formal paper or examination may be requested.

E. The examinations may be taken singly, at various times to be designated by the faculty. Adequate bibliography and sample examination questions for the guidance of students will be made available.

At least two examinations must have been taken by the end of the third semester of residence.

### *Doctoral Dissertation—*

A. Before the student begins to concentrate his energy upon dissertation research, he will prepare a prospectus of the proposed study, in consultation with a faculty dissertation sponsor. Upon submission of the prospectus, a Dissertation Committee of three or more faculty members will be appointed; it will include the dissertation sponsor. The Committee will advise the student in his dissertation work and from time to time will report his progress to the faculty.

B. The student may, if he wishes, ask the Department for *formal acceptance* of his prospectus. A prospectus that is to be formally accepted must provide a detailed outline of the experimental work to be done (if any) and of its theoretical basis. Such a prospectus will be voted upon by all members of the Department. Once the Department has formally accepted a prospectus, it will consider itself bound to accept the resulting dissertation as well, regardless of the experimental results, provided that the proposed work has been carried out conscientiously.

C. When the student has presented a dissertation prospectus, whether or not he asks for formal acceptance, his Dissertation Committee will be responsible for evaluating his competence in the field of Psychology within which the dissertation falls. This field will ordinarily include more than a single one of the areas defined above. It may even include such non-psychological but ancillary areas as sociology, linguistics, one or more physical sciences, etc. The Committee may, at its discretion, require a written examination in the thesis field as a whole or in any part of it.

D. The demands of the field of the dissertation will determine the foreign languages that the student is expected to master. Reading proficiency in at least one foreign language is required for the Ph.D. degree. This language must be one in which substantial psychological literature exists.

The dissertation should provide evidence of originality, scholarship and research ability. It should be a contribution to knowledge, ordinarily an experimental research, but not necessarily so. Upon submission to the Chairman of the Department of a copy of the thesis, signed by all three members of the Thesis Committee, and a successful defense of the thesis before all members of the Department, the award of the Ph.D. will be recommended to the Faculty Council of the Graduate School.

## *Courses of Instruction*

### **PSYCHOLOGY 102a. Psychology of Cognitive Development**

The derivation of developmental principles and their application to problems in the areas of learning, thinking, and perception. *Mr. Morant*

### **PSYCHOLOGY 105a. Memory**

Various psychological theories are brought into focus as they apply to the facts

of human memory. Gestalt Psychology, Behaviorism, Schema Theory, and Psychoanalysis are discussed in relation to such problems as learning and forgetting, distortion, amnesia, and repression. *Mr. Neisser*

**PSYCHOLOGY 106a, or 106b. Field Work in Clinical, Abnormal and Child Psychology**

Students will be given an opportunity for observation and practical work in mental or related institutions, nursery schools, kindergartens, under the supervision of experts and trained personnel. Direct contact with patients or children and discussion with staff members will be afforded. The Waltham School System, Red Barn Nursery School, Massachusetts Mental Health Center, Medfield State Hospital, Greater Framingham Mental Health Center, and other institutions are cooperating.

A student may take only one term for credit. However, if he wishes to continue his work during a second term, and if the institution concerned approves, he may do so without payment of additional fee.

Transportation fee: \$15. per semester.

*Mr. Toman*

**PSYCHOLOGY 107b. Motivation**

The theoretical, comparative, clinical, and experimental contributions to a deeper understanding of human needs, wishes and drives. *Mr. Maslow*

**\*PSYCHOLOGY 108a. Personality**

Study of the theoretical, clinical and experimental contributions to our understanding of human character and personality, with special emphasis on psychological health and on dynamic theory.

*Prerequisite:* Psychology 107b or permission of the instructor.

**PSYCHOLOGY 109b. Perception**

Modern approaches to the problems of perception.

*Prerequisite:* Psychology 118a (in '58-'59, 118b) or permission of the instructor.

*Mr. Held*

**PSYCHOLOGY 110a. Psychology of Problem Solving and Learning**

A study of the creative process, its background and consequences and its relation to perception and learning theory. *Mr. Klee*

**PSYCHOLOGY 111b. Psychology of Symbolic Processes**

Culture as studied primarily from the frame of reference of psychology. Dreams, myths, and art as created, expressed, and as used in language, the humanities, and sciences will be studied as psychologist data. The place of psychology in relation to the humanities and the other sciences will be evaluated. *Mr. Klee*

**PSYCHOLOGY 112b. Psychology of Emotions**

A consideration of the value dimension of the individual's dynamic relation to the world about him in both its positive and disruptive aspects. *Mr. Klee*

**PSYCHOLOGY 113a. Choice, Will and the Ego**

A revaluation of the "active person". Choice, freedom, and responsibility will be considered as psychological problems. A study will be made of the relevance

\* Not to be given in 1959-60.

to choice and action of hedonics, knowledge, reason, and religion, and of man's relation to his perception of good and evil, sickness and health. An assessment of the individual's role in disease and conflict. *Mr. Klee*

**PSYCHOLOGY 114b. Speech, Hearing, and Language**

The findings of physiology, experimental psychology, and linguistics as they bear on hearing and auditory mechanisms; speech; the acquisition and structure of language; verbal thinking and communication. *Mr. Neisser*

**\*PSYCHOLOGY 116a. Advanced Child Psychology**

The works of Erik Erikson and Jean Piaget are juxtaposed. Theoretical emphasis is placed on *normal* personality development.

**PSYCHOLOGY 118a. Physiological Psychology**

Those aspects of physiology most relevant to psychological investigation: the anatomy and physiology of receptor and effector organs, the neuron and synapse, sensory and motor neural pathways, the integrative activity of the central nervous system, the autonomic nervous system and the action of hormonal factors. *Mr. Held*

**PSYCHOLOGY 119b. Comparative Psychology**

Comparison of the behaviors and forms of animal species aimed at placing human behavior in zoological perspective. Topics include: methods for the study of behavior with consideration of their implied universality, the relevance of evolutionary theory, instinct and learning, survey of species, forms of animal communication and society, man in perspective. *Mr. Held*

**PSYCHOLOGY 121a. Psychological Tests and Methods**

Emphasis is placed on the acquisition of self-knowledge in educational, industrial and clinical settings. The course surveys and evaluates relevant psychometric, consultative and applied research methods.

Enrollment will be limited.

*Mr. Jones*

**PSYCHOLOGY 125a. Theories in Psychology**

An historical and critical approach to the central concepts and problems of psychology aimed at an understanding of current formulations. The underlying structures and assumptions of modern theories will be analyzed as products of the development and transformation of ideas commencing with the rise of modern science. *Mr. Held*

**PSYCHOLOGY 126b. Contemporary Theories of Psychology**

The viewpoints and controversies that characterize experimental psychology in mid-twentieth century. *Mr. Neisser*

**\*PSYCHOLOGY 145b. Personality and Ideology**

A study of the interaction of psychological needs and cultural pressures in the formation of social attitudes—political, economic, religious, sexual, racial, etc. The results of research on group differences in these attitudes will be discussed along with studies of the personality traits which are correlated with the attitudes. Students will be given practice in the use of such research techniques as attitude scales and content analysis of projective test and case history data.

\* Not to be given in 1959-60.



**PSYCHOLOGY 200a, b, and c. Individual Research Projects**

*Messrs. Maslow, Morant and Staff*

**\*PSYCHOLOGY 205b. Research Seminar on Theories in Psychology**

Critical and historical analyses of some major viewpoints in scientific psychology will be made by delineating those assumptions—philosophical, physical, biological, and social—which define the domain, structure, and programs of extant theories.

**\*PSYCHOLOGY 206a. Seminar in Learning**

Discussion of selected current problems.

**\*PSYCHOLOGY 207a. Seminar in Perception**

New approaches to the theory of perception.

**\*PSYCHOLOGY 208a. Seminar in Cognition**

Discussion of selected current problems.

**\*PSYCHOLOGY 209a. Seminar in Physiological and Comparative Psychology**

Discussion of selected current problems.

**\*PSYCHOLOGY 210b. Advanced Psychological Statistics**

Discussion of some of the more important statistical techniques, together with the logic on which they are based.

**PSYCHOLOGY 213. Introduction to Projective Techniques**

Discussion of theoretical background; demonstration and practice of selected projective techniques.

*Mr. Toman*

**\*PSYCHOLOGY 214. The Psychological Interview**

Discussion of theoretical background; demonstrations or records of data-gathering, diagnostic, counselling, psychotherapeutic, and psychoanalytic interviews; practice in data-gathering and diagnostic interviewing.

**\*PSYCHOLOGY 215. Psychoanalytic Theory**

The development of Freudian theory to its present status; the conceptual structure of psychoanalytic theory; its significance for psychotherapy, research and understanding of man.

**PSYCHOLOGY 216a. Selected Clinical Topics**

Discussion of theoretical and methodological topics pertinent to the critical study of personality; practice in collecting and interpreting data. The selection of topics and/or exercises will be determined in part by the interests of the participants.

*Miss Hanfmann*

**\*PSYCHOLOGY 218a. Assessment of Traits and Abilities**

Discussion of theoretical background; demonstration and practice of selected instruments of clinical assessment.

**\*PSYCHOLOGY 219b. Approaches to Psychotherapy**

\* Not to be given in 1959-60.

AREAS OF STUDY AND COURSES

**PSYCHOLOGY 220. Supervised Individual Field Work** *Mr. Toman and Staff*

**PSYCHOLOGY 221. Clinical Psychopathology** *Mr. Rand*

**PSYCHOLOGY 290-297. Readings in Psychological Literature**  
*Mr. Toman and Staff*

**290-1** Methodology: Statistics, Experimental Design, Philosophy of Science

**290-2** Systematics: Theories, History, Points of View

**291-1** Sensation and Perception

**291-2** Learning and Higher Processes

**291-3** Physiological

**292-1** Personality and Motivation

**292-2** Psychopathology and Clinical

**293-1** Genetics and Child

**293-2** Social and Anthropology

**293-3** Comparative

**294** Advanced Readings in Methodology and Systematics

**295** Advanced Readings in Experimental Psychology

**296** Advanced Readings in Dynamic Psychology

**297** Advanced Readings in Psychology and Related Fields

**PSYCHOLOGY 300. Department Colloquium and Research Seminar**  
*Mr. Maslow and Staff*

**PSYCHOLOGY 301. Seminar in Advanced Psychological Topics I**

To be offered by a visiting professor.

**PSYCHOLOGY 302. Seminar in Advanced Psychological Topics II**  
*Messrs. Maslow and Morant*

**PSYCHOLOGY 400. Doctoral Dissertation** *Mr. Maslow and Staff*

## Fellowships

- MAXWELL AND FANNIE ABBELL TEACHING FELLOWSHIP IN JUDAIC STUDIES** (1954) Created by the late Maxwell Abbell of Chicago, Illinois, to support a teaching fellowship in the field of Judaic studies.
- EDWARD E. ALLEN MEMORIAL FELLOWSHIP ENDOWMENT FUND** (1959) Established by the family of the late Edward E. Allen of Boston, Massachusetts, and the Massachusetts Association for Retarded Children with a foundation grant of \$10,000.00. The income to be used to subsidize fellowship assistance for graduate students in the School for Advanced Studies in Social Welfare, who are concentrating in the field of mental health.
- ALPHA EPSILON PHI SORORITY FOUNDATION FELLOWSHIP** (1959) Established in honorary tribute to the Founders of this Sorority, for fellowship subsidy in the School for Advanced Studies in Social Welfare.
- ASSOCIATED JEWISH PHILANTHROPIES FELLOWSHIP** (1959) A subsidy from the Associated Jewish Philanthropies of Boston, Massachusetts, to underwrite graduate training in the School for Advanced Studies in Social Welfare.
- MORRIS BURG TEACHING FELLOWSHIP** (1957) Established by Mrs. Mildred H. Burg of Brookline, Massachusetts, in memorial tribute to her husband, to support a teaching fellowship in the area of human relations.
- DORA K. COHN FELLOWSHIP IN SOCIAL WELFARE** (1959) Set up as a memorial by Mr. Ruby P. Cohn of St. Louis, Missouri, to subsidize graduate study in the School for Advanced Studies in Social Welfare.
- IDA AND MARK A. EDISON TEACHING FELLOWSHIP** (1955) Established as a memorial to Ida and Mark A. Edison by the Shapiro Brothers of Auburn, Maine, to support a teaching fellowship.
- ESSO EDUCATION FOUNDATION TEACHING FELLOWSHIP** (1956) A grant from the Esso Education Foundation of Standard Oil Company (New Jersey), assigned as a teaching fellowship, to assist in the undergraduate educational program.
- HARRY AND ELKA GITLOW FELLOWSHIP ENDOWMENT IN HUMANISTIC STUDIES** (1959) Established by Mr. Albert Gitlow of New York City and members of the family as a memorial tribute.
- HERMAN GOLANTY MEMORIAL FELLOWSHIP** (1956) Established by Mr. George C. Golanty of Detroit, Michigan.
- ALEXANDER GOLDSTEIN TEACHING FELLOWSHIP IN SOCIAL SCIENCE** (1950) The income from this \$25,000 fund will be used to support a teaching fellowship in the field of social science. Established as a memorial to her brother by the late Miss Lutie Goldstein of San Francisco, California.
- EDWARD GOLDSTEIN TEACHING FELLOWSHIP** (1954) A grant from Mr. Edward Goldstein of Boston, Massachusetts, to support a teaching fellowship.

## FELLOWSHIPS

**ANNA C. GREENSTONE MEMORIAL FELLOWSHIP (1952)** Established by her children, Mr. Charles R. Greenstone of San Francisco, California, Mr. Stanford M. Green of Livermore, California, and Mrs. Simon Rubin of New Bedford, Massachusetts.

**EDWARD HANO FELLOWSHIP ENDOWMENT (1958)** The income from this fund is to provide supplementary fellowship assistance to gifted graduate students enrolled in the School for Advanced Studies in Social Welfare. A tribute to the late Edward Hano, of Granby, Massachusetts, by his wife and members of the family.

**LOUIS H. HARRIS TEACHING FELLOWSHIP (1955)** Established by Mrs. Max S. Hillson and the late Mr. Hillson of New York City, to support a teaching fellowship.

**EDDIE JACOBSON MEMORIAL FOUNDATION FELLOWSHIP (1957)** Two fellowships in the amount of \$2,000 each for gifted students from Israel, who are preparing themselves at Brandeis University for a more effective career of service in the State of Israel. Established by friends of the late Eddie Jacobson of Kansas City, under the chairmanship of former President Truman and Mr. George Roth.

**ROBERT E. AND HARRY A. KANGESSER FELLOWSHIP TRUST (1951)** Established by Messrs. Robert E. and Harry A. Kangesser of Cleveland, Ohio, the income to be used for teaching fellowships.

**JOSEPH LAPIDES FELLOWSHIPS (1958)** Established by Mr. Joseph LaPides of Baltimore, Maryland, to provide fellowship assistance for two graduate students in their careers of research and scholarship.

**IDA S. LATZ FOUNDATION FELLOWSHIP (1959)** Established by this Foundation to make available a fellowship to a disabled veteran for study at the School for Advanced Studies in Social Welfare.

**LCK FELLOWSHIP IN SOCIAL SCIENCE (1957)** Established by an anonymous friend of the University to support a fellowship in the area of the social sciences, with preference in the field of economics.

**LEVINSON TEACHING FELLOWSHIP IN BIOLOGY (1951)** Established by the James and Rachel Levinson Foundation of Pittsburgh, Pennsylvania.

**DR. MENO LISSAUER TEACHING FELLOWSHIP IN NATURAL SCIENCE (1957)** Set up through a major gift by the late Dr. Meno Lissauer of New York City and the birthday tributes of his colleagues in the Metals and Mining Industry.

**BENJAMIN LORD TEACHING FELLOWSHIP (1956)** Established by Mr. Benjamin Lord of New York City.

**ABRAHAM MENDELOWITZ FELLOWSHIP ENDOWMENT FUND (1959)** Established by the Millinery Workers Health and Welfare Fund in honor of Mr. Abraham Mendelowitz of New York City on the occasion of his 65th birthday. To subsidize outstanding scholars so that they may continue their studies and medical research in biochemistry and microbiology.



## FELLOWSHIPS

**DAVID K. NILES TEACHING FELLOWSHIP IN AMERICAN GOVERNMENT (1957)** To be assigned in memory of a Trustee of the University, who served with distinction as administrative assistant to President Roosevelt and President Truman, for a worthy graduate student who plans for a career in American government service.

**MAURICE POLLACK FOUNDATION RESEARCH FELLOWSHIP (1956)** Established by the Maurice Pollack Foundation of Quebec, Canada, to enable gifted graduate students pursue research programs in the field of Judaic studies.

**BERTHA C. REISS MEMORIAL FELLOWSHIP ENDOWMENT FUND (1955)** Created by Dr. Henry Reiss of New York City for the establishment of the Bertha C. Reiss Memorial Fellowship or teaching fellowships. Awards to be made to students on the basis of their accomplishments in the field of research and/or teaching.

**JULIUS ROSENWALD TEACHING FELLOWSHIPS (1952)** A series of teaching fellowships in memory of the distinguished philanthropist, Julius Rosenwald, established by his daughter, Mrs. Adele Rosenwald Levy, to subsidize the development and teaching of gifted graduate students.

**ISRAEL SACHS TEACHING FELLOWSHIP IN SOCIAL RELATIONS (1952)** Established by his wife and children in his memory.

**SAMUEL AND RAE SALNY FELLOWSHIP ENDOWMENT IN SOCIAL RELATIONS (1952)** Established by Mrs. Samuel M. Salny and the late Mr. Salny of Boston, Massachusetts, the income to support a fellowship in the field of social relations.

**SAMUEL D. AND GOLDIE SAXE FELLOWSHIP IN SCIENCE (1955)** Established by Mrs. Goldie Saxe of Brookline, Massachusetts, and children, to support research and teacher training in the field of science.

**IDA HILLSON SCHWARTZ AND ELIAS EDWARD SCHWARTZ MEMORIAL FELLOWSHIP ENDOWMENT FUND (1949)** Established as a memorial to Ida Hillson Schwartz of Winter Hill, Massachusetts, by her family, the fund has been augmented by a bequest from the Estate of Elias Edward Schwartz. The income to be used in perpetuity as an exchange fellowship, either to bring gifted young people from Israel to Brandeis University or to send Brandeis University students to the Hebrew University in Israel.

**KURT AND HORTENSE SCHWEITZER TEACHING FELLOWSHIP IN AMERICAN CIVILIZATION (1951)** A grant from Mr. and Mrs. Kurt Schweitzer of Oklahoma City, Oklahoma, to support a teaching fellowship in the field of American civilization.

**MORRIS SEPINUCK TEACHING FELLOWSHIP (1954)** Created as a memorial to Morris Sepinuck by his children, Messrs. Samuel and Nathan Sepinuck, and Mrs. George Sorkin of Boston, Massachusetts.

**ISAIAH LEO SHARFMAN TEACHING FELLOWSHIP ENDOWMENT (1956)** Established by Mr. and Mrs. Samuel R. Rosenthal of Highland Park, Illinois, in tribute to Professor Sharfman of the University of Michigan, with preference given to teaching fellows in the area of economics.

## FELLOWSHIPS

- MONA BRONFMAN SHECKMAN MEMORIAL TEACHING FELLOWSHIP (1952)** A grant from the Mona Bronfman Sheckman Memorial Foundation of New York City, to support a teaching fellowship.
- MR. AND MRS. HARRY STADLER TEACHING FELLOWSHIP IN MUSIC (1956)** Established by Mr. and Mrs. Harry Stadler of Hollywood, Florida, in memory of their loving mothers, Sarah Stadler and Etta Berger, to support a teaching fellowship in the field of music.
- GERTRUDE W. AND EDWARD M. SWARTZ FELLOWSHIP ENDOWMENT FUND (1954)** Established by Mr. and Mrs. Edward M. Swartz of Brookline, Massachusetts, to support a teaching or research fellowship.
- DAVID TANNENBAUM TEACHING FELLOWSHIP IN LEGAL INSTITUTIONS (1958)** An endowment to honor the memory of David Tannenbaum of Beverly Hills, California, established by his friends and admirers.
- BEN TOBIN TEACHING FELLOWSHIP (1955)** Established by Mr. Ben Tobin of Hollywood, Florida, to support a fellowship in the field of science.
- UNIVERSAL MATCH FOUNDATION FELLOWSHIP (1957)** A stipend of \$3600 to be awarded to a graduate student, or students, who are concentrating in the fields of physics, chemistry, biochemistry or microbiology, set up by the Universal Match Foundation of St. Louis, Missouri.
- HERMAN WEISSELBERG MEMORIAL FELLOWSHIP (1957)** Established as a memorial tribute by Mr. Arnold Weisselberg of Long Island City, New York, to support a fellowship.
- CARRIE WIENER TEACHING FELLOWSHIP (1950)** The income from this \$25,000 fund is to be used for a fellowship, established by Mr. Herman Wiener of Toledo, Ohio, in the name of his wife.
- BENJAMIN YEAGER TEACHING FELLOWSHIP (1952)** Established by Mr. Benjamin Yeager of Sullivan County, New York, for a teaching fellowship.



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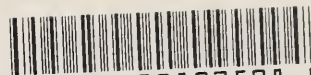








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